

DOCUMENT RESUME

ED 300 153

RC 016 709

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TITLE READI. Computer Literacy for Rural Adults.
INSTITUTION Idaho Univ., Moscow. Dept. of Agricultural and Extension Education.
SPONS AGENCY Fund for the Improvement of Postsecondary Education (ED), Washington, DC.; Idaho State Univ., Pocatello. Cooperative Extension Service.
PUB DATE 86
NOTE 307p.
PUB TYPE Guides - Classroom Use - Guides (For Teachers) (052)

EDRS PRICE MF01/PC13 Plus Postage.
DESCRIPTORS Community Education; Community Involvement; *Computer Literacy; *Continuing Education; *Course Content; Curriculum Development; Educational Innovation; Instruction; Instructional Materials; Outreach Programs; Peer Teaching; Postsecondary Education; Resource Units; Rural Areas; *Rural Education; *Rural Extension; Teaching Guides
IDENTIFIERS Idaho; *Learner Centered Instruction; *READI Project

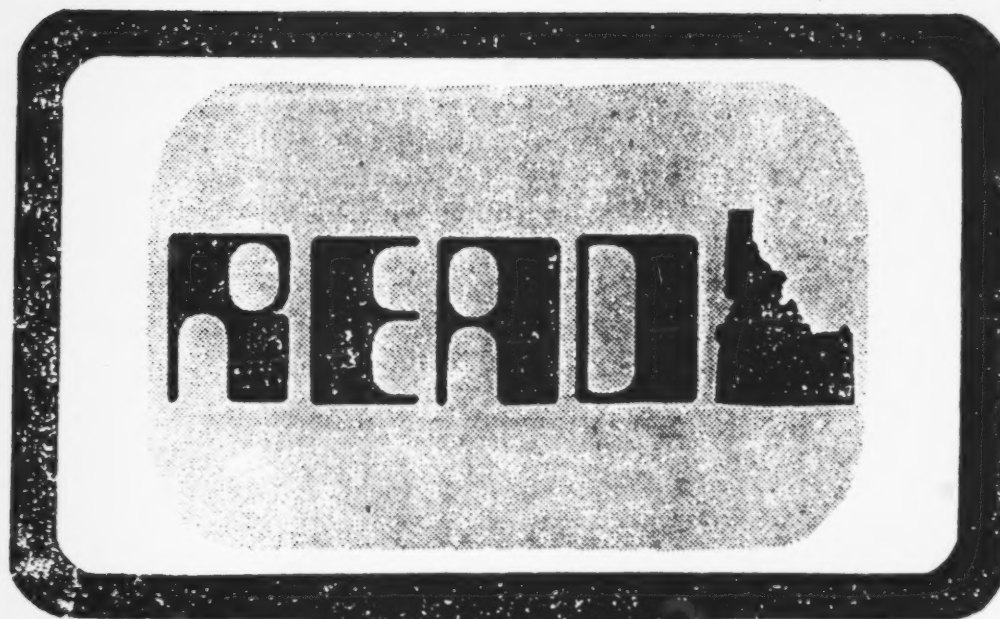
ABSTRACT

READI, a project administered by the Idaho Cooperative Extension Service, adapted to local conditions by community advisory groups, and taught by peer teachers, offers basic training in computer technology to adult residents of rural areas. The READI resource manual has five sections. The first section provides an overview of the project, including key project components, course design, and a rationale for computer literacy for rural adults. The second section is a resource guide for teachers, covering (1) the nontraditional facilitative approach to adult learners; (2) working with groups; (3) workshop design and techniques; (4) workshop evaluation; (5) classroom management; and (6) role plays. The third and fourth sections contain detailed instructional designs and participant materials for Units I and II. Unit I is an introduction to computers. In eight sessions, it covers general computer concepts and skills, as well as basic computer readiness skills in writing, math, decision-making, and problem-solving. Unit II focuses on computer applications to specific problems in the home, on the farm, and in business. It includes word processing, electronic spreadsheets, and data base managers. The last section of the manual includes a 30-item annotated bibliography for the computer user, a microcomputer glossary, and information on additional resources. 11 references. (SV)

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COMPUTER LITERACY FOR RURAL ADULTS:
STRATEGIES FOR INDIVIDUAL AND COMMUNITY CHANGE

HOW COMMUNITIES AND EDUCATIONAL INSTITUTIONS
CAN WORK TOGETHER TO CREATE
EDUCATIONAL PROGRAMS THAT PROVIDE
COMMUNITIES AND INDIVIDUALS WITH RESOURCES FOR CHANGE

Executive Summary

Interest in postsecondary education for rural adults is growing. This interest is spurred by the economic problems facing many rural communities and the consequent unemployment suffered by workers in the major rural industries including fishing, mining, oil, timber, and agriculture. Many people look to educational resources as one means to counter the current situation by providing access to new job skills and opportunities. For example, classes can help rural learners upgrade their credentials to become better prepared to deal with change. The rural learner population is also growing as adults return to complete degrees. The result is an increasing demand for educational services by non-traditional students. Indeed, recent research indicates that participation in rural postsecondary education programs is increasing at rates greater than those found in urban areas, and that expectations for educational opportunities in the learner's area are rising. Much of this demand for educational opportunity is related to new technologies, and in particular, classes in computers are much sought after.

As with learners in urban areas, rural adults recognize the potential impact computers will have on both their lives and the future of their community. Rural communities which are losing jobs due to the economic recession need to provide re-training opportunities to their residents. Many of these potential jobs require computer knowledge. Indeed, it was estimated in 1985 that 25% of all workers use the computer as a primary work tool.

Computers have also become increasingly important to home management and educational programs. Both small businesses and farm/ranch operations in rural areas are feeling the impact of the Information Age. In addition, the development of advanced telecommunications systems promises to have a tremendous impact on our lives. Isolation and distance are easily overcome with new interactive telecommunications systems. Rural areas, in particular, have much to gain from new technology.

Despite the potential advantages for rural communities, many are at risk for being actively involved with new technology because they lack educational resources in new technology. A number of internal and external factors interact to make access to computer related educational opportunities difficult to achieve. Internal factors such as lack of self-confidence, poor basic skills, and the traditional rural ethos keep many rural adults from traveling to attend courses at college. External factors, including the economic dislocation caused by the decline of natural resource-based industries, rural isolation, and lack of an appropriate educational response to technological change, have resulted in a dearth of opportunities for rural adults seeking to become computer literate. This vicious cycle of technological illiteracy, declining educational resources, high unemployment,

and lack of mobility are increasingly desperate problems for states with large rural populations.

The rapid proliferation of computer technology has resulted in a demand for computer literacy courses. Such courses are important because many people cannot learn about computers on their own. Either they do not have the necessary equipment and resources or they prefer to learn with someone in a guided setting. Rural people, in addition, often lack access to the kinds of continuing education and vocational extension programs that can provide such training. The READI Project provides a means by which communities can fill this void by developing a program that can offer computer literacy training to rural adults.

The READI Project designed a curriculum that can easily be adapted to a number of different adult education programs. Instructor materials provide background information, class outlines, and activity descriptions. Participant materials accompany the class outlines with general information and worksheets. The understanding that readiness skills (math, estimation, problem-solving, writing, and decision-making skills) must precede and underlie literacy skills was a key insight in the curriculum planning and development. By integrating theories about math anxiety and adult development with techniques for peer-teaching, READI has made a significant contribution to the field of computer education.

The project also developed a unique method of making the READI opportunity available to rural adults. Working through the Idaho Cooperative Extension Service, READI developed county advisory groups to oversee the implementation of READI at the local level. These groups recruit students, select peer teachers, promote classes, and design long-range plans. Peer teachers selected by the county committees received training from the State Office in how to use the curriculum and how to manage computer classrooms. Peer teachers offered classes to over 650 adults in Idaho.

The recognition that educational experiences which focus on the growth and development springboard both individuals and communities into additional activities is the single most profound insight of this project. While READI itself is a small ripple, the concentric circles of reaction resulting from an initial program or class are extensive. Many READI participants have changed jobs, found new jobs, taken additional classes or bought computers as a result of their positive first experience with education and technology. Several communities have expanded READI to include a brokering function with other colleges, the development of community education programs, and/or community economic development efforts. Peer teachers who had never taught before have increased their teaching activities and expanded their community activities.

READI has made an important contribution to the lives of many Idahoans and their communities. There is much we can learn about educational intervention in rural communities from the project's positive and negative experiences.

First, rural people want and need access to educational opportunity in general and to education on technology in particular. They will go to great extremes to attend classes.

Secondly, the community can effectively broker between educational institutions some distance away and the rural population. Community/institutional

collaboration results in more effective classes and a greater likelihood of success for all involved. Communities, however, are not geared to take on this role without support. One clear lesson from the READI Project is that two years is not enough time to develop the infrastructure and support system to keep the brokering function going. These ties need a commitment from the institutions for long-term nurturing and support in the form of leadership training and resource development.

A third lesson from this experience is that finances are not the source of rural outreach problems. Students can and will pay to attend quality classes. Rather, it is the institutional and community commitment to work together and support a program that is critical to its longevity. Community groups, like those in the READI Project, which rely on volunteers to attend to long-range planning, goals, and strategies need more than a budget operating in the black to keep going.

Not surprisingly, the success of many classes was dependent on the quality of the peer teacher. Some communities were very forgiving of teachers unsure of their role; others were not. Training experiences were critical to the success of many peer teachers, but even that experience could not overcome basic inadequacies in group process and computer skills. Team teaching, in the long run, was the best strategy for assuring a quality educational experience. Some dedicated and enthusiastic peer teachers successfully mentored other community members into following in their footsteps. Because of the lack of experience in group work on the part of many peer teachers, many parts of the curriculum designed to develop problem solving, decision making and critical thinking skills were less effective than hoped. Some peer teachers facilitated the class by rote rather than by presenting concepts.

A fifth lesson from the READI experience relates to participants. Despite the fact that computer training and computer use, except for data entry and word processing, is overwhelmingly male in this society, the majority of READI participants are female. In addition, when there is a computer in the home, the women are more likely to use it than the men. Many rural men work in traditional rural industries where their jobs are tied to the past, in occupation as well as lifestyle, while many rural women are faced with working outside the home for the first time in occupations that, while they don't pay well, are tied to the future.

Finally, the READI Project has demonstrated that a general approach to new technologies is an effective tool for job training. In one sample of participants, 22% reported receiving new work responsibilities, 8% changed jobs, and 16% began a new job.

READI works with individuals and communities concerned about their future. It demonstrates the value of collaborative planning between communities and postsecondary institutions. Clearly, the introduction of new technology will change rural life. It remains for rural residents to decide how they will interact with that technology, as actors guiding its influence and facilitating change or as victims at risk of losing jobs, homes, and communities.

Information about READI can be obtained from:

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Introduction

This resource manual is a guide for teacher/facilitators who are interested in helping their fellow citizens learn the skills necessary to participate more fully in the Information Age. It is particularly intended for adults living in areas where access to educational opportunities is limited by isolation, distance and topography but can be adapted for any group of learners. Specifically, it provides a plan as well as resources for offering a computer literacy program to rural adults. In addition, the manual suggests follow-up activities and possible spin-off programs.

The READI Project and the development of this resource manual were funded by the Fund for Improvement of Postsecondary Education and the Idaho Cooperative Extension Service in cooperation with the University of Idaho. The instructional designs, activities and other resources included in the manual were field-tested in four counties within Idaho during 1984-85.

READI was developed because many rural people lack adequate access to new technologies and the training necessary to use them. There is, thus, a need for a cost-effective method of providing basic information about computer technology to people living in rural communities. READI provides a means to meet this need. This resource manual provides:

- Materials for classroom activities that teach both skills and concepts related to computer technology and the application of that technology to today's problems.
- Suggestions for enhancing the teaching/learning process.
- Classroom learning activities that teach people how to use the computer as a tool for problem solving and decision making.
- Ideas for conducting a basic skills review for those participants who have been out of school for some time.
- Participant applications that foster critical thinking, decision making and management skills.
- Suggestions to help both individuals and READI groups use READI as a springboard to additional training in computers or other areas and to developing spin-offs such as user groups, computer expos or farm management programs.

For more information on READI or the participant's manuals, contact: Mary Emery, Agricultural Sciences 111, University of Idaho, Moscow, Idaho, 83843-4196.

The READI Project

An Overview

Origins of READI

The READI Project began as a spin-off of the New Dimensions Project in 1982. The New Dimensions Project developed curriculum as well as a training model for community leaders interested in increasing women's skills and opportunities. While working with advisory committees in several small communities, we were struck by the interest in computers. Access to training on computers or classroom activities using computers, however, was virtually unavailable for many rural residents. READI applies what we learned from New Dimensions about adult education programs in rural environments and the educational needs of rural adults to the increasing need for computer literacy.

Because the project not only addresses a new need, but also applies a new approach to meeting that need, we were able to secure a 3-year grant providing partial funding for the project from the Fund for the Improvement of Postsecondary Education. The Idaho Cooperative Extension Service and the College of Agriculture at the University of Idaho provided additional support.

The goals of the project were to develop an effective and appropriate curriculum and to pilot a cost-effective delivery mechanism for that curriculum. During the first year of the project the curriculum was developed and the test sites selected. During the second year of the project we tested and modified the curriculum. In addition, the READI State Advisory Board began working on suggestions for making the project self-sufficient at the county level. During the third year, we offered the program at additional sites, completed the project evaluation design, and disseminated the project to other areas.

The Extension Connection

READI is administered through the Idaho Cooperative Extension Service for several reasons. Extension provides a mechanism for working on the county level. County Extension faculty know their communities well. Their sponsorship provides both legitimation and a support structure. In addition, involvement with READI provides extension faculty with an opportunity to enhance their own computer skills while providing computer literacy to those clients interested in agriculture, business or home economics computer applications.

The READI Project mirrors other extension programs with its state advisory board, county advisory groups and course leaders. The project relies heavily on volunteer time and the county faculty's role as an enabler. This state/county/community structure of Cooperative Extension provides an effective method for implementing READI and sharing both the risks and responsibilities of the project.

While the extension connection has worked well in Idaho, the program can also be adapted to work with adult education, vocational extension and community education programs. In such a case, an already existing advisory committee would most likely oversee the READI program along with other courses.

Project Components

READI has three components: the state office, the county committee and the actual courses themselves. The READI Project links all three components into a workable model that allows community groups to direct the project on the local level.

State Level — At the state level, the state READI coordinator is responsible for getting the project going. He or she helps new counties get involved in the program by disseminating material and working with local groups. The state office helps to coordinate computer use and other resources, oversees training and provides coordination and evaluation support. In Idaho, the READI state coordinator also has responsibility for a project newsletter.

County Level — The READI community advisory groups are organized to oversee the READI Project on the local level and as such play a vital role in the program's success. The committee is an essential link in the transition from a generic statewide project to an effective local program. The committee makes this transition possible by overseeing the selection of local peer teachers, organizing logistics and recruiting participants. In addition to adapting READI to local needs and resources, the committee also participates in evaluating the project's successes and problems. The committee is also responsible for developing useful and up-to-date referral information for READI participants. By researching opportunities, the committees help READI participants not only see the READI experience as a stepping stone to other activities, but also to use these skills to make a contribution to the community. The advisory committee uses the experiences of READI participants and their own knowledge of the community to plan future directions for the project in their location.

Course Delivery — The actual classes are facilitated or taught by peer teachers. When possible, these peer teachers receive training in teaching computer literacy to adults. This training may be available specifically for READI participants through the Cooperative Extension Service or indirectly through continuing education classes or the State Computer Teachers' Association.

Peer teachers are chosen not only on the basis of their understanding of computers, but also because of their involvement with adults and their interest in educational or job training activities.

Potential READI Spin-offs — In addition to sponsoring READI classes, county committees have expanded their interests and activities to include many follow-up activities and spin-off programs. Some of the ideas of interest to these groups include:

- County computer expos,
- Computers and economic development workshops,
- Community computer user groups,
- Joint READI/4-H "each one teach one festival,"
- Joint READI/school district training sessions,
- Computers and farm management conference,
- Parenting in the computer age workshops,
- Computers and home management workshops,
- County fair computer displays,
- Computer and small business management programs.

READI Resource Manual Organization

The READI Resource Manual is organized into five sections. The first section provides an overview of the READI Project including a rationale for computer literacy for rural adults and of the key components of the project. The second section is a resource guide for teacher/facilitators to help them improve and refine their approaches to teaching rural adults. It also includes guidelines for adapting the curriculum to a specific county's needs. The third and fourth sections provide detailed instructional designs for Unit I and II respectively. Materials from the participant manuals are also included here. The last section provides information on additional resources.

How To Use This Manual

Sections I and II provide background material for peer teachers. These sections should be studied carefully before any work on the courses is begun. Peer teachers will want to refer back to Section I while preparing class presentations on technology in rural areas and the overview of the program. Information in Section II will be useful in designing lesson plans.

Section III contains a suggested class outline for each of the eight topics in the Unit I curriculum. These class outlines can be used as is or modified to better meet the needs of a particular class. Participant materials follow the facilitator's information.

Section IV is organized somewhat differently. Because the topics in the participant's manual do not correspond to specific classes, the instructional materials do not correspond to specific topics in the participant's manual. Lesson plans for this unit are not as well defined since much of the class activity will be determined by the kinds of projects students choose to work on. Participant materials are also included in this section.

The instructional materials in Sections III and IV can be followed explicitly in teaching a READI course or they can be adapted. The *Guidelines for Custom Fitting Your Workshop* worksheet at the end of Section II will be helpful in deciding how best to adapt READI to a particular group of learners.

Computer Literacy for Rural Adults

Introduction

Computers are quickly becoming an everyday item. Children use them at school. Farm families work with them to manage the farm more effectively. Homemakers use them to do financial management. In short, they have become an integral part of our banking and communications systems, and more and more businesses and homes are acquiring them. This rapid proliferation of computer technology has resulted in a demand for computer literacy courses. Such courses are important because many people cannot learn about computers on their own. Either they do not have the necessary equipment and resources or they prefer to learn with someone in a guided setting. Rural people, however, often lack access to the kinds of continuing education and vocational extension programs that can provide such training. The READI Project has designed this manual to help communities fill this void by developing a program that can provide computer literacy training to rural adults.

The READI Project was developed not only because of the demand for computer education in rural areas, but also because of the concern that rural areas with no access to computer training will continue to be left behind in this age of new technology. Opportunities to learn about computers are important to both individuals and to communities. Such opportunities are particularly important for those areas where the traditional rural industries are no longer able to support large portions of the population. Programs which foster the development of computer-related skills among rural adults can be vital resources in such rural communities. For instance, efforts in both job creation and economic development in these areas are likely to be related to new technologies. As a result, many employers now seek to upgrade existing employees in this technology as well as to hire new employees who are already computer literate. In addition, the computer-literate consumer is increasingly important to the smooth flow of business as more and more establishments add computerized customer services. Computers are also important in education. The role of computers in their own and their children's education has encouraged many adults to narrow the generation gap by becoming computer literate. Finally, many rural adults seek educational opportunities in computers simply because of the fascination they have for the new technology.

Access to computer literacy programs is not the only problem rural adults face. Often when programs do exist, they do not meet the needs of the students. For example, many existing courses focus exclusively on programming or on learning a specific software package. Teachers can assume that students have high levels of verbal and math skills which results in many people dropping out. Those students who do finish are often unable to use what they have learned because they do not know how to apply that knowledge to existing job and home situations. These experiences show that there is a need for a class which can acquaint adult learners with the computer and its uses as a tool for decision making and information management without making assumptions about verbal and math skills. The READI approach to computer literacy has been designed to provide a relevant and useful introduction to the computer and to computer applications by focusing on the computer as a tool.

The READI Approach To Computer Literacy

The READI approach to computer literacy is multifaceted in that the curriculum takes into account a number of factors. The goal of providing computer literacy is coupled with an understanding of the need for basic skills review, practice in problem solving and decision making, and work/educational referral information. READI also emphasizes an appreciation for rural values

and lifestyles. In addition, the READI curriculum is learner-centered in that it focuses attention on the needs and concerns of the specific students it serves. Finally, since education does not take place in a vacuum, the READI Project is designed to discuss implications for the future and to enhance critical thinking skills so that rural adults may play a more pro-active role in the Information Age.

An educational program designed to bring computer literacy to rural areas must address the factors that prevent rural adults from entering the computer age. Access is, of course, a critical factor because many rural people live too far from existing programs, and these programs have neither the resources nor the expertise to conduct courses in more isolated areas. Further, these rural communities cannot by themselves provide educational opportunities for their residents. These external factors of distance, geographic isolation, poverty and lack of resources can be overcome. The READI Project provides a model for using local resources and expertise in developing low cost courses in computer education for adults.

In addition to external factors, internal factors such as poor esteem, lack of basic skills, math anxiety and inadequate communication skills also prevent rural adults from taking advantage of whatever educational opportunities may exist. Local ownership and control of the program tend to break down barriers for adults who want to attend computer courses. The READI curriculum has been designed to include activities which foster self-esteem and encourage self-motivation as well as those that review basic skills. Each of the elements described below plays a key role in fostering a positive learning experience.

Course Design — The READI curriculum design is intended to enhance problem-solving and decision-making skills, as well as to teach people about computers. Actual class activities are designed with two principles in mind. The first principle is that adults learn best by doing, particularly with activities that have a direct application to some part of their lives. For hands-on activities to be successful, however, the instruction must go beyond drill and practice and involve the students in the discovery of knowledge. Such activities will also enable participants to retain what they have learned and to integrate new knowledge more easily into everyday life.

Secondly, interaction among peers can provide a very effective context for learning. Participants increase each other's understanding and self-confidence by sharing feelings and successes, by comparing problems and solutions, and by teaching each other. Since one of the goals of READI is to provide a learning experience which empowers participants to take hold of new opportunities, it is essential that the courses provide a setting where ideas can be exchanged and individual goals can be enhanced.

The curriculum included in this manual has been designed with a certain pedagogical approach in mind. The manual makes a reference to the fact that learning is a process in which the learner must be actively engaged. This manual does not support a technical approach to implementing computer literacy either in content or in method, but rather approaches computer literacy from a problem-solving focus with an emphasis on group interaction. The design reflects a belief in the need to recognize a variety of expertises and to share information in a meaningful way so that learning is both an exciting experience and a new discovery.

The Learner-Centered Classroom — Recent reports on the state of education in the United States have focused on the learner-centered classroom as the best method for teaching critical thinking skills and problem solving (Bennett 1985). The learner-centered classroom provides learning ex-

periences which revolve around the needs of the learner and which place the learner at the center of the learning process. This approach is particularly useful with rural adults who want a relevant and useful classroom experience. In addition, fostering a positive attitude to the learning process is important to both self-esteem and self-motivation.

Useful and Relevant Class Experience — One of the problems many learners have is that they can learn some things well in class, but not be successful in applying the skill to their own lives. The READI curriculum was designed with this concern in mind. Thus, peer teachers are encouraged to use examples taken from the everyday life experience of those taking the class rather than a canned example taken from a text. In addition, the suggested agendas include an activity at the end of class where participants can reflect on what they learned and how they will use it. The last sessions of both Unit I and Unit II also include activities that encourage individuals to develop a plan for how they will implement what they have learned. For some who want only to be able to converse better with the younger generation about computers, this is not a complicated activity, but for the majority of our participants who want to find new jobs or computerize their farm or business, this activity provides them with an opportunity to develop a plan of action and to identify a first step.

READiness Skills for Computer Users — Using the computer in problem-solving situations also provides an opportunity to review basic skills. Since many rural adults did not finish high school, had an inadequate high school experience or simply have allowed these skills to get a little rusty, it is essential to provide some review and instruction. We cannot produce computer-literate adults without also dealing with illiteracy in other basic areas. While the READI course does not substitute for an ABE or GED program, the curriculum has been written with attention to this need. Thus, reviews of math and writing skills necessary for specific types of problems are included. Clearly, if we are to empower adults by becoming computer literate, we must address those skills that help individuals to write correctly, to estimate answers and to use correct formulas.

The READI Definition of Computer Literacy — The question of what constitutes computer literacy is a difficult one, made more so by the currently changing definition of literacy itself. Literacy was once defined by the ability to write one's name. Since then it has been redefined several times as more and more complex skills are required to function effectively in our society. Some educators now define literacy less in terms of specific skills and more in relation to the issue of empowerment, for example: What are the skills necessary for individuals to increase their control over their own lives and to function independently? This new focus on literacy has also meant more emphasis on critical thinking and reasoning skills as well as on problem solving and decision making (Chall 1984).

As more and more colleges and high schools add computer education to their requirements, and as more and more jobs involve computer-related skills, literacy is being redefined to include computer skills. Indeed, the report, "A Nation at Risk," stated that "effective participation in our 'learning society' requires each person to be able to manage complex information in electronic and digital form. A basic objective of education is for each student to learn how to identify needed information, locate and organize it and present it in a clear and persuasive manner" (quoted in Wilson Library Bulletin, March 1984, 472). The READI approach supports both the critical literacy definition of literacy and the view that computer skills are now a necessary component of what it means to be literate in our society.

Despite agreement that computer literacy is quickly becoming a necessary skill, the definition of computer literacy is still a subject of hot debate. Most people now agree that computer literacy is something more than knowing how to turn on the machine and boot up software. Most also agree that computer literacy should entail some understanding of the social, political and economic impacts of the new technology on individuals, as well as on the community and the nation. Also at issue is the level of technical expertise that should be included in a computer literacy curriculum. While some argue that people drive cars without knowing a thing about the mechanical parts of the automobile and can therefore use a computer similarly, others argue that some technical background is essential to empowering people to be effective computer users. In particular, programming skills are at the heart of the controversy. With the development of more high level languages and more sophisticated software programs, the argument that everyone should know how to program in at least two languages has lost ground. However, one question remains: Should programming skills be included in a computer literacy curriculum? The READI curriculum includes several sessions on programming skills for the following reasons:

- Students experience a great sense of control over the machine when they can successfully run a short program of their own.
- Teaching people some programming skills helps them learn about how the computer handles information and performs tasks.
- Teaching programming skills helps develop problem-solving abilities.
- In our post-evaluations, learning about programming rated very high among participants. Since the amount of time spent on programming is quite small and the skills very basic, it is perhaps more true to say the READI curriculum teaches about programming rather than actual programming itself (Fawcette 1984).

The Computer as a Problem-Solving Tool — Central to the READI approach to computer literacy is a focus on the computer as a tool. Just as teaching someone how to use a hammer or sewing machine involves much more than just how to work the tool, using a computer also means that the person needs to learn how to apply the tool. Despite the fact that people will apply computer power to a wide range of situations, it is possible to focus on common situations, such as family budgets and mailing lists in order for students to learn how to use the computer as a tool. In addition to focusing on common applications, each participant is encouraged to apply a variety of computer tools to situations in their own lives. In previous READI classes, for example, a small town city clerk experimented with putting her records on a data base, a number of people looked at keeping their small business records on data bases, and teachers made electronic record books.

In summary, the READI approach to computer literacy includes the following:

- Examining the social, political and economic impact of computers on the future of individuals, communities and the larger society.
- Reviewing the skills necessary to apply the computer as a tool, including problem solving, decision making, math, writing and information organization.
- Helping participants gain confidence in using the machine by learning computer terminology and about programming.
- Creating an opportunity for participants to learn how to manipulate and use data as well as to understand how computers store and use data.

- Empowering individuals to make better decisions about their future and the role of computers in that future.

The READI curriculum guidelines presented in this manual have been designed for a maximum of flexibility, recognizing that no two classes will be the same.

Making the READI Opportunity Available to Rural Adults

The READI Project has been successful because it provides for maximum flexibility. Another reason for its success is that it places some of the responsibility, as well as some of the risk, on rural communities. READI provides an opportunity to expand local expertise and resources in both computer-related activities and leadership development.

Local Ownership — The READI Project has been developed on the assumption that local communities or county committees will take responsibility for running the project on the local level. University extension or continuing education programs share in that risk by providing additional expertise, help with networking and access to a support person. This arrangement of shared responsibility and risk results in a program with local ownership and control and expanded resources.

Local ownership of READI programs means that responsibility for budgeting, including fees and instructor compensation, recruiting students and instructors and overseeing class operations, is done locally. READI was piloted through the Idaho Cooperative Extension Service and the READI Project became one of several volunteer-run projects in those counties. The same method of organization could be used in continuing education or community education programs.

Arranging for classes is a common problem continuing educators face in developing programs for rural adults. Not only are there problems in getting the program out to isolated areas, but there are also problems in finding the right time. Rural adults are generally busy with family and community responsibilities. Educational opportunities must be worked into these schedules carefully. In addition, seasonal factors, such as harvest, hunting season, winter roads, etc., influence how successful a program will be in getting students. Often programs brought to rural communities have a poor turnout not because of a lack of interest, but rather because of a conflict in schedules. Because the local committee has responsibility for scheduling classes, READI has not had these problems.

In addition to administering the programs at the local level and developing relationships with local resource people, the community advisory committee is also charged with developing a strategic vision of how technology will influence the area and implementing strategies for maximizing the positive impact of technological change. Since rural areas are known for the way they cherish traditional values, the committee must mediate between the needs for constancy within the community and the influence of change. For each community, as with each individual, this balance is unique. What is acceptable in one area may not work in another. The READI approach provides for flexible schedules and program designs, allowing classes to differ from community to community. The local committee monitors the success of the courses based on local criteria. The central office or support person monitors the quality of the instruction.

Shared Expertise — By providing resources to local people, the project helps to foster local expertise, both in computer education and in leadership development. The READI Project is, at heart, a grassroots-oriented program encouraging active and meaningful participation by everyone in all aspects of the program. Part of the success of the project has been the development of local ownership in the program and, hence, local investment in its success.

Since one of the problems in educational outreach historically has been the identification of qualified personnel, a key component in sharing expertise has been the training and support of local peer teachers by the central office. The project found that there are many talented and knowledgeable people in rural communities who are interested in supporting adult education. However, many of these people have had no experience working with adult learners or haven't the time to design a course. With support from the state office and an existing curriculum, such peer teachers can expand their own expertise and provide an important and continuing resource to the community.

Since the goals of the project are to enable rural communities to cope more effectively with the Information Age and empower individuals to have more control over how their lives will be changed, developing local leadership skills in the planning and development of programs and in computer technology is critical to the success of the program. The fostering of such skills and expertise on the local level allows communities to make better decisions related to the impact of new technology by applying this expertise to local conditions and concerns, something experts from the outside have difficulty doing.

READI Spin-offs — The purpose of the READI Project is not simply to provide computer literacy programs, but also to encourage individuals and communities to plan for tomorrow. Some READI projects have sponsored additional workshops on related topics, compiled information on computer use in their area and hosted community computer expos. Here in Idaho the project office encourages the development of related activities and materials and provides a mechanism for networking them among other groups.

Developing Partnerships with Others — A key theme for education in the 80s is the formation of partnerships. The READI Project is essentially a partnership between an educational institution and community groups. The project also provides a means for working with other agencies and institutions. For example, many school districts have benefited because one of their teachers is a READI instructor. This instructor is able to bring new ideas, materials and resources into the school as a result of the READI connection. READI benefits because most of the courses are taught at schools. In other partnerships, the Cooperative Extension Service and vocational education programs in small business management and farm management provide follow-up to the READI classes. Local businesses have sent employees to participate in READI and as advisory committee members. Finally, READI graduates have often returned to school for credit classes.

Rural America in the Information Age

The impact of the Information Age will affect all aspects of American society, but this impact will not be the same for all of us. Indeed, many observers believe that rural America has potentially more to gain, as well as potentially more to lose, from this transition than other groups. Rural communities can gain access to resources and jobs, or they can lose the flavor of rural life. Dillman (1985), for example, maintains that advances in telecommunications could circumvent the one-to-one contact that is characteristic of a rural lifestyle. An individual can do all his/her business and/or job assignments from home with the new technology. At the same time, however, new technology could make virtually any educational opportunity available to the most remote learner; it could bring the marketplace and the workplace to isolated settings making rural communities more viable.

Technological Gatekeeping — Acquisition to certain skills and access to resources to develop those skills often act as gatekeepers to other opportunities. For example, certain levels of math achievement function as a gatekeeper to most of the higher-paying occupations. Just as an inadequate math background has kept many rural adults from better employment opportunities, lack

of access to technological training can also become a gatekeeper (Emery 1985). For this reason, the question of access is essentially one of equity. Equal opportunity for education, training and employment for rural people necessarily means equal access to training in technology. Within the rural context, equal opportunity requires that special rural populations, such as women, Native Americans, Hispanics and Blacks, as well as the sons and daughters of blue collar workers, receive the training they need to compete effectively in tomorrow's world. Not only is it important for rural residents themselves, but knowledgeable people are also critical to the future of rural society because the rapid rate of technological change can pass by rural areas or contribute to the development of a more resilient and healthy rural society.

Educational Implications of New Technology — Technology offers a means to bring education to all Americans. It can increase educational opportunity at a time when technological change is increasing the demand for education. That technology, however, depends on adequate training for those who use it and access to necessary telecommunications equipment. Thus, interactive video and cable classes have the potential to end the disenfranchisement of rural learners and provide them with an opportunity to exercise their right to education. On the other hand, the existence of such programs can also provide an excuse for limiting educational outreach to only those with the necessary finances, skill levels and equipment, thus, potentially increasing the disenfranchisement of rural learners.

Technological systems for increasing educational outreach are only one aspect of rural educational programming. Technological solutions must be tempered with a sound understanding of educational needs and cultural conditions. Telecommunications programs that further isolate learners by having learners learn at home or by themselves at a learning station have not been successful for many rural learners. Programs that combine the advantages telecommunications can offer with meaningful group learning experiences combat the sense of isolation and increase learner confidence while providing sound educational content via telecommunication or computer technology.

In addition to providing access to education, new technology will also change the need for and content of educational programs. The National Institute of Work and Learning estimates that new technology must be matched 100 percent with training to maximize productivity (Snyder and Edwards 1983). Therefore, educational programs will play a more vital role in both community economic development and in individual careers in the future. Since it is likely that career changes will be the norm, job retraining will become commonplace. For rural areas where there is a tendency to inherit one's job, this development will mean drastic changes in lifestyle and life expectations.

Cultural Implication of Technological Change — Culture has been defined as managing the contradictions between tradition and change (Dillman 1985). Since tradition plays such an important role in rural lifestyle, culture is an important component of the rural ethos. However, rural society is not immune to the changes wrought by the rapid rate of technological development. Hence, rural society is likely to experience great cultural changes as well as economic and social change. Although technology itself is neutral, the application of technology can also be negative. For example, new machines and robots have meant job loss for many Americans. Computers can mean family togetherness, but they can also lead to family disruptions. Telecommunications could finish what better transportation has already done to turn the smaller communities into ghost towns or it can be a tool for overcoming the isolation of the most remote areas. The READI materials encourage individuals to think about potential cultural as well as economic and social changes and to work toward developing positive outcomes.

New Technology and Jobs — One of the most far reaching effects of technological change is job loss and job creation. The National Institute of Work and Learning estimates that, by 1990, 13 to 21 million jobs will be lost and only 8 to 11 million jobs will be created. Many of the jobs expected to decline are those most commonly found in rural areas, including jobs related to logging, farming, and mining (Edwards and Snyder 1983). This trend, coupled with the decline of natural resources-based industries, will mean drastic changes in the labor force structure of rural areas. *Omni Magazine* (Sept. 1985: 75-78) predicts that lumberjacks, farm workers and factory workers will be almost extinct by the year 2000. Opportunities for growth appear to be confined to two strategies: locating new high tech firms in rural areas and enhancing small business growth and development. In Idaho, where transportation problems limit the attractiveness of the area to industry, and where over 90 percent of existing jobs are generated by small businesses, the latter strategy is likely to be most effective. Computer skills, technological literacy and access to telecommunications will play important roles in the growth and development of small business.

Not only will technology influence the loss of some jobs and the development of new jobs, it is also transforming many existing jobs. In 1985 it was estimated that 25 percent of are jobs require direct use of computers. Probably another 25 percent use them indirectly. Clearly computer skills are becoming ever more critical to an individual's place in the job market.

Idaho like many other states with large rural populations, must come to terms with the increasingly desperate economic and social problems resulting from high levels of unemployment and deindustrialization, lack of mobility, declining educational resources and technological illiteracy. Computer literacy programs provide a resource by providing resources to break this vicious cycle of poor educational background, high unemployment and increased social problems.

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Leader's Guide*

Overview

This Leader's Guide is included to provide facilitators with some background in how to present educational programs to adult learners. We have tried to gear the information so it is particularly appropriate for rural adults. Therefore, this guide includes information on:

- Working with Adult Learners
- Accommodating Different Learning Styles
- Facilitating the Learning Process
- Working with Groups
- Designing Workshops
- Techniques for Teaching Others
- Setting Up a Workshop or Course Session
- Establishing Criteria for Success
- Evaluating Your Workshop
- Classroom Management Suggestions
- Learning Curves for Developing Skills in Using Computer Software
- Working with Advisory Groups
- Pre-planning for Effective Workshops
- Guidelines for Custom Making Your Workshop

The ideas and techniques discussed in this guide have been particularly useful to those who piloted the READI Project in their own communities. We have included them here as a resource to help you develop confidence in working with groups and to provide information useful for developing your own course outlines.

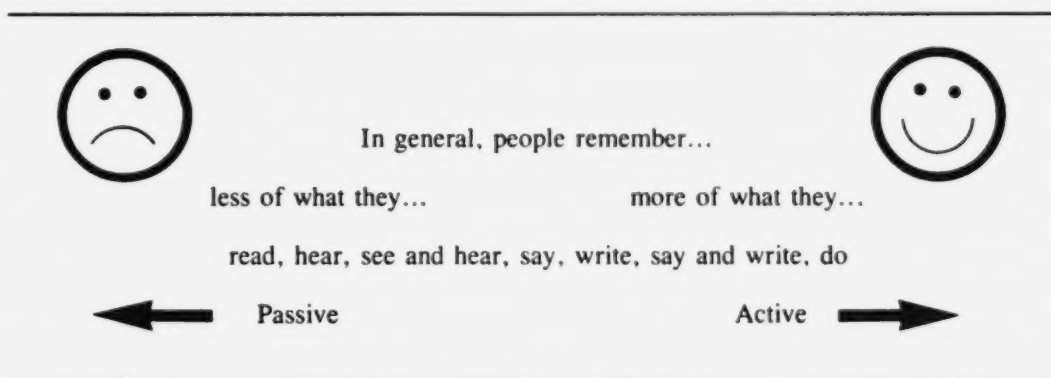
*These materials were originally developed for use in the New Dimensions Project. New Dimensions is a FIPSE funded project to develop educational programs for rural women.

Working with Adult Learners

When many of us think of school or classes, we have a picture in our minds of a typical schoolroom with the teacher in front lecturing and the students at their desks listening. Experience working with adults in educational settings has encouraged many adult educators to revise this model. In designing this READI approach, we asked some of our READI participants to brainstorm responses to the question, "How do adults learn?" Some of their responses were:

- It must be relevant and something I can use.
- I must be comfortable with my fellow learners and with my surroundings.
- I like to interact with others and get to know them.
- I like to practice or try out the skills presented.
- There must be lots of discussion.
- The instructor must be prepared.
- Lectures are OK if they are short and well prepared.
- The room must be comfortable.

In short, adults prefer learning settings where they can be actively involved in the learning process and where the manner in which the materials or skills are presented is relevant to the everyday experience of the learners. Research has also shown that the ideas brainstormed by the READI participants reflect the types of educational programs that have been most successful with adults. The following chart illustrates this point.



Often this perspective on learning is described as a form of non-traditional education. Sometimes people associate this perspective with adult learning theory (androgogy) and distinguish that from theories about how young people learn (pedagogy). Others, such as Paulo Friere, refer only to traditional and non-traditional pedagogy to refer to all teaching approaches. Paulo Friere, a Latin American educator, has written a great deal about teaching and teaching approaches. The following chart summarizes some of the key distinctions he makes between traditional and non-traditional education.

	Traditional teaching	Non-traditional teaching
Role of the teacher	- lectures - asks questions to test - plans all activities - directs	- facilitates group - coordinates and presents information - finds resources - participates in discussion
Role of the student	- passive - listens - takes notes - follows direction - memorizes	- active - asks questions - discusses - plans - gives feedback - questions - contributes expertise

These distinctions are important to keep in mind when you are working with adult learners. The non-traditional approach is more successful in helping people learn and retain new concepts or skills for several reasons. First, this approach recognizes that learning cannot be passive. To actually learn something, as opposed to simply memorizing information, creates real change in ourselves and our way of thinking. This is why many people use the image of a light bulb when describing a true learning experience. When an idea, skill or concept really takes hold, the light comes on, and we see the significance of the new information for ourselves as well as for others.

In addition, when the learner is actively involved in the learning process, she/he has access not only to new knowledge or information but also to the process by which she/he is learning the new information. For example, rather than teaching computer math by drawing pictures on the board and presenting rules to be memorized, we suggest that participants manipulate objects and try out equations on the computer to learn the relationships involved.

This method enables learners to be actively involved in the learning. The result is that learners can return after the class and recreate the learning exercise for themselves. In this way, access to knowledge, particularly in terms of understanding and using the learning process, becomes available to everyone rather than remaining the sole province of experts. Not only does this approach encourage the learner to facilitate his/her own learning process, but it also recognizes that adults already have valuable information and skills. Thus, one of the tasks in facilitating learning is to find out what a learner knows and to use that information to bolster self-confidence and to provide a basis for exploring new concepts. For example, a person who sorts mail can use this knowledge for learning how a computer stores values. Many of the learning activities included in this manual provide opportunities for learners to share their knowledge and skills and to teach each other.

In applying these principles of learning to your own workshops, we encourage you to think about your own successful learning experiences. Use these recollections to design a learning process that can create the opportunity for others to learn. In addition, rely on your own past experience, and that of others you know, to think of what resources were most helpful, what questions were most useful and how you remembered what you had learned. Read books on working with groups and adult learners, and begin to develop your own file of resources, ideas and information.

Accommodating Different Learning Styles

Since every learner has an individual learning style, a variety of methods is helpful in teaching any concept. In other words, one strategy or example may not work for everyone. Part of the reason we learn differently is because many of us approach learning from different perspectives. Some of us learn better when we are able to look for connections, make links between different ideas, work with open-ended questions and rely on our own intuition. Others are more comfortable with logical explanations and working with finite objects and quantities. In relation to math problems, this means that some of us work better with spatial problems and visual explanations of concepts, while some work best with word problems and written explanations, and still others like numbers and formulas.

The fact that we work best in one mode or another is often seen as a weakness, so it is important to emphasize that there is no one right way to learn or to solve problems. Helping your participants understand that there are different ways of approaching learning can give them an important insight into why they may have had problems with some subjects in the past.

This understanding is essential to developing confidence in problem-solving skills because it teaches people how to rephrase the problem into the mode where they work best. For example, some spatial problems can be translated into verbal problems or number sentences. Knowing that people learn differently will help you to prepare a variety of activities that appeal to different learners and to alternate methods of presenting each concept.

Facilitating the Learning Process

A key concept in non-traditional teaching is the idea of facilitation. The idea of facilitated learning is based on a philosophy of learning which recognizes that learning must be active and that, in reality, everyone is both teacher and learner at different times in their lives. Thus, in facilitated learning* the role of the leader is not that of the expert who tells people the information or directs them to learn new skills. Rather, the role of a facilitator is more akin to that of a helmsperson who guides the group and keeps participants headed in the direction they want to go. Where the responsibilities for traditional teachers involve preparing lectures and worksheets, grading tests and directing classroom activities, those of a facilitator are quite different.

For the traditional teacher, most of the hard work is done before class, so that the in-class experience follows a pre-arranged scenario. For the facilitator, the hard work is not finished with the preparation for the class, but continues in class as the facilitator and the group work together to meet the goals of the class. Therefore, facilitation involves setting the stage for learning by preparing information and resources, designing learning activities that will provide an opportunity for participants to work through an effective learning process, sharing leadership with the group members to keep them involved and committed and encouraging participants to explore and develop as persons.

We urge you to develop a picture of yourself as a facilitator of learning rather than as an expert. As the facilitator, your role in the learning situation is to help people feel comfortable in the group, to listen as much as or more than you talk, and to help others understand what they have learned. This means that as a facilitator you give up some of the privileges of being a member of the group

*An excellent resource on facilitation skills is *Becoming: A Leader's Guide*, available from Women's Equity Action.

for the responsibility of making sure that the group keeps on track and that people have quality time to work on their goals. Quality time is defined as an opportunity for people to work in a supportive, comfortable and organized context toward goals that have meaning to them.

One of the most important aspects of the facilitator's job revolves around group dynamics. As the facilitator, you are responsible for ensuring equal participation among participants, for actively listening to clarify questions, for paraphrasing comments, for asking effective questions and for reminding people of the task at hand. Specific facilitation skills to practice include:

- active listening
- speaking for yourself and learning to avoid putting words in others' mouths
- giving concrete examples
- stating your position clearly
- asking open-ended questions
- encouraging the participants to move beyond personal blocks represented by such words as can't, won't, should, ought to, etc.

Finally, it is important to recognize that most of us who become workshop facilitators do so because we have some personal agenda of our own. While it is important for facilitators to have personal growth goals, the responsibility of the facilitator is first to make the group work. Therefore, our own interests, experiences and opinions must take a back seat to the goals of the group. Because facilitation is a different and challenging role, we recommend that classes be facilitated by two people instead of just one. This arrangement allows one person to concentrate on content or the equipment while the other focuses on group dynamics.

Working with Groups

Interaction is an important part of most people's learning process, and, thus, the quality of that interaction can either aid or interfere with the mastering of new skills or ideas. Since the lessons in this manual are designed to take place in a group context, it is important for workshop leaders to understand something about how groups work. Working with groups requires some special skills, as well as a sensitivity to group dynamics. Some of the skills on which you will need to rely when working with a group are mentioned in the previous section on facilitating the learning process. Other skills are based on common sense. Still others require some understanding of group dynamics.

Each group has its own dynamics. While every group reflects the characteristics of the individuals involved, a group is more than just a collection of individuals. That is, once a group is formed, it takes on its own special characteristics and dynamics. Although every group is unique, all groups are influenced by the leader or the facilitator. For example, groups tend to be uncooperative or grouchy when they are asked to do things they don't like. Examples of other things groups don't like include:

- being bored by too many stories or long-winded lectures
- being talked down to by paternalistic or maternalistic folks
- being crowded, cold, hungry or otherwise uncomfortable
- being asked a question with an obvious answer
- being told what to do or what to think
- having their experience or ideas discounted
- being forced into doing something

What groups do like is problematic. On the one hand, they like to be entertained. While entertainment may create a high level of interest, it can also deflect participants from the learning process. In addition, entertainment implies an active leader and a passive audience. On the other hand, groups do like to be actively involved. Because involvement is necessary to the learning process, this curriculum has been designed to facilitate the involvement of the group in the class activities.

The tone of involvement is set right at the beginning, often the first time you talk to a prospective participant. Furthermore, expectations about participation in the group are established during the first few minutes of your class or workshop. Therefore, class participation is particularly crucial during the first few minutes of the session because these interactions will set the tone for the entire workshop.

If participants are asked to passively listen to a lecture, then that is what they will expect to do all the time. As a result, it will be much harder for you to get them involved in participatory activities such as sharing or brainstorming. If they come in and immediately have an opportunity to talk about something meaningful to themselves and to the group, then you will have set up an expectation that this is their group. As a result, participants will develop an investment in making the group work and in learning to trust the group environment.

While each group is different, there are some elements in common. Each group must account for both the task functions — how the work gets done — and the maintenance functions — how the group works together. Too much emphasis on task will hurt people's feelings and cause dissension. Too much emphasis on maintenance will not get the work done and cause impatience. Therefore, a balance between task and maintenance is essential. Since each person is comfortable with a different balance, the facilitator must work on striking a balance that works for everyone.

You will easily be able to identify those who are more task oriented than others in the group and vice versa. The tension that results from each person searching for his/her own level of comfort is very healthy for the group as long as no one person or clique dominates. Understanding the relationship of task and maintenance functions will help you troubleshoot group problems and develop appropriate interventions.

Group dynamics are affected by the size of the group. Small group activities work best with 3 or 4 people per group. Large group activities that require the participation of all members work best with groups of less than 16. If your group is larger, you can modify those activities or, better yet, divide the group in two. If you have more than 25 people, you will have to rely on small group activities, lectures/presentations and discussion as the main activities. We suggest that READI classes be 20 persons or less. This size allows everyone to participate and encourages a friendly, informal atmosphere.

Several books and articles are available as resources for working with groups. *The Resource Manual for a Living Revolution*, published by the Quaker Movement for a New Society, contains a great deal of helpful information and ideas for working with groups.

Designing Workshops

Shaping an agenda for a class or workshop must take into account all of the elements discussed. In particular, the facilitator must discover the process by which a person takes information from his/her own experiences, challenges it, compares it and uses it as a basis for extending learning. The learning activity should result in not only an understanding of new ideas, concepts or skills, but also a better appreciation for the process by which we can claim new knowledge as our own. The designing of an agenda should also take into consideration the dynamics of the group.

Techniques for Teaching Others

Several techniques are useful in developing an agenda for working with adult learners. The following is a list of techniques that were valuable to the leaders of the READI classes:

Warm-ups: These activities begin each session. As such, they set the tone for the class in terms of participation. Sometimes they are serious activities that center the group on the topic for the day. Other times they are fun activities that generate energy and diffuse tensions.

Examples of warm-ups include:

1. Have each member of the group share the answer to a question, such as: "How did I use what I learned this past week?" or "One question that concerns me is _____."
2. Lead the group in a stretch break.
3. As a fun activity, play a game like "touch blue" — leader calls out a color, and participants must touch someone with that color on, and so on.
4. Have a game booted up on the computers for people to play as they come in. Begin the formal session with a brief discussion of the game.

Introductory Warm-ups: These are special warm-ups used at the beginning of an entire course or workshop series. They are important in setting the tone for the courses, getting people to know one another and forging a comfortable group atmosphere. Therefore, it is important to develop an activity that allows people to get to know each other, such as "Introducing Your Partner" which is an exercise where individuals pair off for awhile and then summarize their discussion as an introduction of the person to the whole group. Other examples are included in the curriculum.

Agenda Review: List on the board or on newsprint the agenda for the class — the objectives and the activities. Review this agenda and give everyone an opportunity to discuss and make suggestions. Provide a suggested time breakdown so people can see how the evening or afternoon will be spent. Ask the participants to acknowledge their agreement to follow the agenda.

Brainstorm: This activity gives everyone a chance to contribute. In brainstorming everyone responds to the question or comments on the task at hand. There is no discussion in brainstorming; it is used to get ideas, feelings and information out.

Summary: Each class, and often most activities, need a summary or wrap-up at the end. This time should be spent in helping people think over what they have learned and how they will use it. Sometimes a learning list — brainstorming what people have learned — is a good way to do this. Discuss the list and how people will use the new information or skills.

Evaluation: An important part of every session should be evaluation. The group can evaluate the quality of the group interaction as well as how well the agenda worked. One way of doing this is to go around the room and have each person say one thing they liked about the session and one thing they didn't like. Every negative comment should be accompanied with a suggestion for improvement. Sometimes a variation of this activity, called "wishes and pluses," is used. In this activity, people share one plus about the session and one wish for the session. Sometimes a midterm written evaluation is used. Here each person completes the sentences: I feel good about this group (class) because _____, and I am worried about this class because _____.

Setting Up a Workshop or Course Session

Before the Session:

- Ask yourself, who are the people who are coming and what do they want from this experience? Brainstorm what you think some of the special concerns might be. Picture in your mind who will be sitting in the group — what will they be doing, why will they be there, what will they be saying?
- Using the information from above, develop a list of objectives or goals for the session. These goals should answer the questions: what will we accomplish, and why will we do this?
- Decide what activities will help you reach these goals.
- Finally, and perhaps most importantly, try out your agenda and the learning activities you have developed before you meet with the group.

Session Format:

- Begin each session with a warm-up exercise. This will help participants orient themselves to the classroom environment, and it sets an active tone by getting everyone involved. Often if a person is not involved at the beginning of a session, he/she will not participate throughout.
- Review the agenda by going over the objectives and activities scheduled for the session. Ask the group if the agenda meets their needs.
- If this is the first meeting of the group, you will need to clarify expectations with the group. Give each person a chance to tell the other group members why he/she is there. Provide an opportunity for the class to discuss this list of expectations. Refer to the list when planning future sessions.
- Introduce the topic for the evening. Many times a brainstorming activity will accomplish this task either by listing questions and concerns or information the group already knows.
- Present the activity you have designed to teach new skills or ideas. Since most sessions involve more than one activity, it is important to plan activities that work well together but have different formats.
- Summarize the activity after everyone has had an opportunity to complete it. Discuss not only what was learned but how people felt about doing it.
- End each session with a wrap-up. Use a learning list or ask people to discuss what they learned and how they will use it.
- Finally, evaluate each session using one of the methods discussed earlier.

After the Session:

- After the workshop or class session, allow time for you, as the facilitator, to evaluate the session using the information generated in the class evaluation activity and your own perceptions. This activity is most useful when others are involved. You may wish to make a short agenda, share initial impressions, brainstorm what worked and what didn't and discuss how the activities could be improved. Ask yourself or the group how well the objectives for the session were met. Should another activity be substituted for one used during that session? Also, discuss the group process. You may wish to get feedback on what facilitation skills you used well and which ones need improvement. Use this opportunity to get tips on how to be a better facilitator. This may also be a good time to discuss resources for anyone in the group with a special concern or problem. An alternative might be to free write for 15 minutes on how you felt about the class.

- Relate the session to the overall goals of the course or workshop series.

To summarize, the philosophy behind this approach to learning and designing workshops is that the learner must be an active participant in his/her education; he/she must grapple with the information and twist it about his/her own life in order to claim it as his/her own.

Establishing Criteria for Success

As you develop your class and your own facilitation skills, it is essential that you have a method for measuring your success. When dealing with individuals and groups, it is sometimes easy to get discouraged with yourself or with the participants when things are at a low. Develop your own criteria for success so that at the end of the workshop or class you will have a sense of how well you have met your own expectations. For instance, I will know I am a success if:

- I finish the two units I contracted to do.
- Three people learn something new that builds their confidence.
- I am no longer nervous speaking in front of a group.
- One person wants to continue learning new skills.
- People enjoy the courses.

Write up your ideas of what success means to you and be specific. We encourage you to keep a journal or notebook with your criteria for success, your expectations for the class and your personal goals. After each class, write how you felt about the class, what you would change and any comments people gave you. Be sure to include ideas for the next time you do the session. This journal will help you see yourself develop as a facilitator, provide guidelines for when you do the course again and become a valuable source of information on working in groups.

Evaluating Your Workshop

Evaluation is important for several reasons:

- It can provide you with the feedback you need to make any necessary adjustment in your workshop design before it's too late.
- It can help you sharpen your facilitation skills.
- It can keep you in touch with what is really going on out there in the group.

Evaluations are usually thought of as tools for the exclusive use of the facilitator, but they can be helpful to participants as well. An evaluation process can provide them with an opportunity to reflect on the learning experience, to become more aware of group dynamics and their own role in the group and to take more responsibility for both the group process and their own learning process. Evaluation is commonly thought of as a questionnaire at the end of the course or workshop. Although this method is important in getting feedback on the overall success of the program, it is not as useful for either diagnosing problems or giving feedback to participants. We suggest, therefore, including all of the following evaluation strategies.

Session Evaluation: Plan to spend a short time at the end of each session on evaluation. Vary the methods you use to avoid a feeling of repetition. For example:

1. **Wishes and pluses:** Give each person an opportunity to think about the pluses for the day and the things they wished had happened. Have participants share their ideas. Record their observations on newsprint. Discuss any wishes that can be implemented for next time.

2. **Liked, didn't like and changes:** Follow the same instructions as above, but have the group respond to the questions: what did you like, what didn't you like and how would you change what you didn't like?
3. **Informal discussion around the question:** how do you feel about today's session?
4. **Written responses to any of the above:** These are to be shared by the facilitator at the next meeting.

Midterm Evaluation: Take time halfway through your workshop to get feedback:

1. Ask participants to write on cards: I feel good about this workshop because . . . and, I am worried about this workshop because . . . Share answers in a small group or all together. Discuss responses and ideas for improving the workshop.
2. Hand out a questionnaire: This asks people how they felt about the course — the materials, the exercise, the facilitation, etc. Ask them if their expectations are being met. Make it a short questionnaire. Organize the results and present them to the class for discussion.

Final Evaluation: Since the purpose of this evaluation is to see how successful your class has been, you will want to ask questions about what was learned and how people are using their new skills. You will also want to know how effective the activities were, and, therefore, you will need to include some questions about the exercises themselves, the materials, the facilitation, etc. Last, an evaluation should provide an opportunity for participants to make suggestions for improvement. Review your objectives while designing the evaluation. Often in the READI Project, we provided an opportunity for the class to discuss the evaluation. Such a discussion can help bring the experience to a close.

Follow-up Evaluation: During the course of the READI project, we did several follow-up evaluations to get a feel for how well people were able to use their new skills and the information developed during the workshops. The results of this evaluation procedure were extremely useful in revising materials and activities. Some suggestions are:

1. Have a member of your advisory committee phone the participants and ask them several questions about how they are using the ideas, skills and materials from the workshop; how they feel about the experience in retrospect and what suggestions they have for changes.
2. Six months after the workshop, send out postcards with two or three questions on them for participants to answer and return.
3. Interview selected participants to get in-depth information.
4. Send out a follow-up questionnaire one year later. You may wish to include questions about how the workshop experience has affected other aspects of each person's life.

Classroom Management Suggestions

Putting computers in the classroom requires an adjustment for both facilitator and learner. People working in small groups around computers can result in a very disordered and confusing classroom. Add to that the fact that it is more difficult to get people to stop their work on the computer than is normally true of other group activities, and you have a situation that can be disconcerting for the most experienced facilitator.

Several techniques can be used to provide students with a more orderly learning experience. First, if at all possible, conduct your discussions, lectures and other class business away from the computers. It is preferable to have learners sit in a circle to increase participation. Try to do

as much explaining of activities and teaching away from the computers as possible. When you must teach while learners are at the computers as in Unit I-Session III, give them short tasks and follow immediately with discussion.

For teaching with the computer, plan a series of activities or problem-solving situations for groups at the computers. With adult learners, it is unlikely that you will have them all doing what you planned at the computers. Curiosity, different levels of expertise and specific expectations encourage learners to explore beyond the immediate assignment or to change it. In the READI Project, we have encouraged this type of modification among participants, although it can put more pressure on the facilitator.

To make the class work well for participants, the facilitator must check on each group to see that they are learning something. It is often the case that one group will have finished the assignment and be waiting for something new to do, while others are engaged in working on their own project. The facilitator must either be ready with additional ideas and activities for these groups or begin mixing groups so they can learn from one another.

Finally, it is important that each computer session end with the group all together. Such discussions provide learners a chance to evaluate their experience, share insights with each other, and discuss implications and applications.

Learning Curves for Developing Skills In Using Computer Software*

In a recent article published by INFOWORLD, Adam B. Green writes that the traditional ways of measuring how easy it is to use a computer program may not give an accurate picture. For example, in order to determine how easy it is to learn a package, we often look at how long it takes a novice to get the program up and running. However, Green comments, "users learn about their software every day. To fully understand the effort required to learn a program, you may have to watch people using it for as long as a year." Green has developed four different learning curves that apply to four different types of software applications. As you begin to teach different software packages, try to develop a learning curve for each and use it as a guide in developing your teaching approach.

The first curve he calls "the ramp." This curve looks more like a traditional learning curve in that it illustrates how much more effort developed gradually over a period of time is needed to develop expertise. This curve, he says, fits the experience of learning Lotus. Appleworks also follows a ramp-like learning curve.

The second curve he calls the "the wall." He says it is fairly simple for users to learn how to enter data into Data Base II or III, but when they try to move on to more sophisticated applications of the program, they "hit the wall." That is, they have to learn a number of new concepts and skills all at once in order to "climb over the wall" to become a programmer. Failure to learn all that is required means that the user "falls back in defeat." Learning about programming in basic may have a similar curve. It is easy to write simple programs, but to go on to more sophisticated programming requires learning a number of new concepts and skills.

*Information adapted from The Unseen Nature of Learning Curves by Adam Green. Printed in INFOWORLD, July 22, 1985, p. 28.

A third curve is one he has labeled "the hurdles." The example he uses is learning about telecommunications. The hurdles are made up of a number of small walls requiring extensive effort to overcome. Programs that require users to go through the hurdles are constantly frustrating. According to Green, this learning curve explains why so many people do not use their modems.

The last curve he identified was "the pit." The example he uses is learning the DOS Sub-directories. In this learning experience, the learner develops an understanding of using the programs, but finds when the application changes, he/she did not really understand it at all. Using ProDos often has the same effect on people.

Not only does understanding the learning curves of particular applications help facilitators prepare better learning activities, it also explains why many people never make full use of their equipment and software. Part of this is very understandable. Users buy the equipment and software, after all, to perform a task, and they want to get the task done. Hence, they often do it the hard way because of the time and effort involved in climbing the wall or getting out of the pit. One of the goals of READI is to help people reach higher levels of expertise by smoothing the walls, hurdles, and pits into gentler, easier to learn learning curves through the development of insightful discovery activities.

Working with Advisory Groups

The READI courses are supported by local community advisory committees. We feel this approach contributes to the success of the program in several ways. Local advisory committees provide support for the conveners; they sponsor the project locally, they represent different cross sections of the community, and they provide answers and insights into many questions and problems. Advisory committees have also helped with evaluation by calling people after the class was over.

Most of the READI committees were formed by the county agent getting together with several people in the community interested in computers and new technology. This initial group made up a list of other groups to contact and specific people they wished to recruit. Through one-to-one contact, the initial sponsors spoke with potential advisory committee members to assess their interest and get their ideas.

Since rural people tend to lead very busy lives, it is important for the potential advisory committee members to see how they can contribute to the specific tasks of the group. At the same time, it is important to work with the group to develop a group process and sense of comradery. As a peer teacher, you can contribute to the group by identifying specific ways advisory committee members can help your class be more successful. Invite them to visit and to contribute to the project.

Tips on Using Role Plays

Role plays are useful in learning situations in several different ways. For example, they can help the learner:

- Try out new behaviors or approaches.
- Experience situations from a different viewpoint.
- Apply a theory to a real life situation
- Learn about a process or interaction.

The READI curriculum has been designed to include many role plays that involve the participants in acting out a process. It is hoped that acting out the process will make the information both clearer and easier to remember.

Many adults have reservations about participating in role plays. They may feel conspicuous or self-conscious about themselves. Here are a few suggestions on how to make your role plays go more smoothly:

1. One way to increase the level of comfort is to involve everyone, either by giving the audience specific observation tasks, or involving everyone in some sort of demonstration. A useful approach is to break the group into small groups and have each small group work on a role play. These small groups can report back to the whole group for discussion.
2. Role plays that focus on specific behaviors should involve only a few characters and should be written so that the characters have distinct and conflicting viewpoints.
3. When people role play, they often build to a level of intensity which is followed by a lull. After the initial lull, they will reenter the role play with new insights. Wait for this second lull before analyzing the experience.
4. Always provide ample time for discussion and feedback.
5. Consider repeating the role play either to allow players an opportunity to polish their skills or to give others an opportunity to play the roles.
6. Interchange observer and actor roles.
7. Consider letting the learners write their own role play. Allowing learners to describe their situations and feelings will make the role playing more realistic and relevant.
8. Always introduce role playing by relating it to a specific learning objective.
9. When discussing the role play, focus on the interaction among players rather than on the acting.
10. You can sometimes increase participation in role plays by rotating players and observers. For example, an observer can tap a player on the shoulder and then replace that person in the action.

Pre-Planning for Effective Workshops

1. Who is the audience?

Level of knowledge:

uninformed

informed

expert

Approach to the topic:

antagonistic

interested

advocate

2. What is the role of the workshop leader?

Catalyst for action

Provide information

Link resources

Help with process and communication

Solve problems

3. Why is the session being held?

Training in new skills

Staff development

Organizational development

4. Why will people come?

It's required

Improve job situation

Learn new ideas

Enhance job or personal life

5. What will people gain from the workshop?

New skills

Enhanced knowledge

Change in attitude

6. Describe the content of the workshop:

Subject

Topic

Resources available to people

7. How will you organize the format?

Help people develop a personal stake
in the class

Objectify subjective experiences for
others to learn from

Develop a common language

Provide for experiential learning

Create a learner-centered atmosphere

Reflect on the group's learning

8. What techniques will you use?

Small groups

Lecture/presentations

Large group activities

Tests/quizzes

Individual work

Computer groups

9. How will you evaluate the session?

Informal mechanisms

Formal mechanisms

10. How will you modify the plan?

Guidelines for Custom Making Your Workshop*

Custom-made draperies are those cut from a general pattern, but adjusted for one special fit. This notebook is a general outline you will need to custom fit to the special needs of your community. The following are guidelines to help you focus on what those may be and suggestions for making the necessary alterations. Please remember that just as some patterns call for drastic changes, so you may feel the need to change the entire focus of the course, eliminate a whole section or add something totally new.

A. General information about your community:

1. Describe the people in your community by brainstorming (brainstorm with friends):

Who are they? How do they refer to themselves? (example: loggers' wives)

What does their average day look like or how do average days differ?

What kinds of things do they enjoy doing? _____

What kinds of things do they dislike doing? _____

What are their main concerns or what do they care about most?

Why would they be interested in your class? _____

What kinds of things motivate them to come to educational programs?

*These guidelines were developed for facilitators of the New Dimensions project in rural communities of northern Idaho and eastern Washington. We encourage you to develop similar guidelines for your staff.

2. Describe any special event, activity or crisis people are dealing with now.

B. Questions for setting up your program:

1. How do folks find out about events in this community? _____

2. Who will help you spread the word? _____

3. What organizations do people belong to? Who are the contact persons?

4. What will I say to these groups if I make a presentation about the project?

5. What papers do people read? Who do I contact? _____

What will I put in the paper? _____

How will people who read the article know that this is for them? _____

6. What radio stations do folks listen to? Who do I contact? _____

What will I say? _____

How will people who hear about the course know that this is for them? _____

7. Where can I hold the session so that everyone will feel comfortable? _____

Who will I contact? _____

Is there a charge? _____

8. Who is the county extension agent? _____

What can I ask the agent to put in his/her newsletter that will let people know about the course? _____

9. What other organizations have newsletters I might have access to? _____

10. Would some people be interested in an information session? _____

What would they want to know about? _____

How would they know to come? _____

C. Developing an advisory committee

1. Who knows the people in this community and their needs?

2. What different cliques, sides of town, etc., exist here? _____

Who do I know from each of them? _____

3. What can I say that will help them see the value of their participation? (What will this program contribute to the lives of people they know? To the community?)

D. Structuring your materials to make it relevant

1. List 10 concerns, problems, responsibilities, or experiences that individuals in your community deal with every day. For each item try to list two ways to use it in your course or workshop.

Item	First Use	Second Use
1. Money Problems	Unit II family budget	example of how computers can be used in the household
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____
5. _____	_____	_____
6. _____	_____	_____
7. _____	_____	_____
8. _____	_____	_____
9. _____	_____	_____

2. List five concerns or issues in your community. For each item list at least two ways to incorporate it into your class.

Item	First Use	Second Use
1. _____	_____	_____
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____
5. _____	_____	_____

3. When you think about doing your course in your community, what do you want people to get out of it?

Skills: _____

Attitudes or Ideas: _____

For each thing you list, go through each lesson plan and think of how that lesson will help you meet your goals for the class. Use the back of this sheet (Lesson -, Skills, Attitudes or Ideas. Read over your lists; how will you make sure they see the connections? Make notes on your agendas to help you remember to include this.)

4. What happened at the training or what materials in the notebook do you feel are not relevant or appropriate to your community? Why? _____

Discuss this with others to get their ideas. For each item you listed above, what changes will you make and why?

5. What kinds of things do I do well as a teacher or facilitator?

How can I best use those skills in each session? _____

6. What kinds of things do I have trouble with as a teacher?

How can I work to improve these skills? _____

What alternative options exist to using them? _____

How will I deal with this in each session? _____

7. For each session, describe the general background of types of relevant experiences your participants are likely to have. List ways you can draw on them as a basis for teaching skills or attitudes in each session.

Experiences

Ways to use them

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

8. For each session, list your objectives. For each objective, write down a process for achieving it, the tools (skills and materials) you think will help you with that process and the outcomes of your project.

Objectives or Purposes for Teaching

Process or Activity

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Skills/Tools/Materials

Outcomes

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Unit I

Instructor's Guide

Introduction

The goals of the Unit I curriculum are to provide rural adults with the skills and information they need to be educated consumers of computer software, to decide on their future use of computers, and to acquaint them with the computer as a problem-solving tool. This instructor's guide has been developed to help you present the READI curriculum. It is intended to accompany the **UNIT I PARTICIPANT'S MANUAL**.

These materials include an overview of objectives and the competencies for each session, as well as a sample micro design and an activities description. These materials are meant as guidelines to be used in setting up your own class and in conjunction with the Leader's Guide and the READI Overview.

Terminology

Learning computers is in some ways akin to learning a new language. New terms and computer jargon can frustrate learners. The READI approach to teaching people about this new technology has been to introduce new terms in demonstrations or with examples rather than assuming participants will memorize a list of words and their definitions. In addition, several READI classes have used the program, Terminology Quiz, at the beginning of the class as a review.

READIness Skills

In addition to focusing on computer-related skills, the curriculum also calls attention to READIness skills. These are skills with which students must have some experience to successfully develop their computer skills. They are the bottom rungs of a skills ladder which ends with computer proficiency. For example, writing with a word processor requires adequate writing skills to be successful. Spreadsheets require a basic understanding of math and the ability to estimate if one is to use them effectively. Each session includes activities geared to develop competency in the underlying skills as well as the targeted READIness and computer skills.

The curriculum, as it was developed, begins with math READIness and computer operation skills, moving on to writing and word processing. One of our reviewers suggested that, since many adults have math anxiety, the classes might better begin with writing and word processing. An alternative micro design can be found at the end of this section for those who would choose this option.

Combining Unit I and Unit II

Several READI classes have opted to combine Unit I and Unit II. They felt that people wanted to move faster and more directly into the applications. A sample micro design covering the two units in one class can be found at the end of the Instructor's Materials for Unit II.



Session I

Introduction to Computers

This and the last session are the most important classes you will hold. The first session is important because it will set the tone for all that follows. Your participants' first impression of you and the curriculum

will color how they participate in everything that follows. Therefore, this session must first make them comfortable. Several techniques are useful in this regard. For example, helping people to learn and use each other's names is one way to set a comfortable, informal tone. Providing an opportunity for them to say why they are here and what they want gives them some stake in how it all works out as well as makes it clear that their contribution is important. In addition, evaluation activities and discussions will encourage them to think about their role and how they can influence the class's directions. Since one of the goals of READI is to help people use the class as a springboard to other activities, discussions that probe into the whys and wherefores, as well as those that encourage people to think about how they will use what they have learned, are essential. These activities often require close facilitation at first because many people are unfamiliar with them.

While helping participants feel comfortable with each other and while the class is important, the main reason people attend is to learn about computers and they will want to get started on the machine as soon as possible. For many this will be their first hands-on experience, so it is essential that all equipment and software be double-checked to make sure everything is in good working order. The software you choose for this session should be simple to use, but challenging and stimulating to adult users. Public domain games and demonstration programs, such as Apple Presents Apple, are good choices for this first session.

In short, the goal is to have the participants leave the class feeling comfortable with you, the machines, and their fellow students, as well as being able to identify at least one useful thing they have learned.

Session I

Overview

Objectives

- To introduce participants to each other and the facilitators.
- To introduce participants to the parts of the computer.
- To briefly discuss the history of the computer.
- To provide participants with a positive first experience with the computer.

Competencies

READIness Skill:

1. Keyboard familiarity.

READIness Resource:

1. Have software that provides an introduction to the keyboard available.

Computer Skills:

1. Turn machine on and off.
2. Boot up a program.
3. Identify parts of the computer.

Pre-Class Tasks

1. Write up on newsprint and also, if possible, run off copies of pertinent information on the computer the class will be using including booting procedures, ROM, RAM, etc.
2. Put agenda, welcome and instructions for activities on newsprint for use in class.
3. Plan several effective discussion questions for each section of the agenda and try them out on people to see how they work.
4. Check all equipment and test all software.

Sample Agenda

Time	Activity	Materials	Comments
Pre-class	Using computers	Easy-to-use software or make up a 4SQ program or data base file.	See Public Domain List
5	Welcome		

Sample Agenda (cont'd)

Time	Activity	Materials	Comments
35	Introduction, 4-Square	Software or cards	Instructions on newsprint may be helpful.
	(3) Explain activity		
	(2) Answer questions		
	(5) Share answers in pairs		
	(15) Introduce partners		
	(10) Review expectations		
15	Course overview	Newsprint	
5	Agenda review	Newsprint	
10	Break		
65	Introducing the computer		
	(20) Name and explain components	Signs for components	
	(10) Software demonstration	On/off and loading instructions on newsprint	
	(35) Hands-on	Software	
10	Learning list	Newsprint	
5	Evaluation	Newsprint	

Activities Description

1. Introductory Warm-Up

First impressions are critical. To set an active tone for the class, we want to get people involved doing things from the start. We also want to have people take part in discussion or speak out at the very beginning so they have established themselves as active participants in the class. A substantial part of the first session should be taken up getting people acquainted and comfortable with each other, the computers, and the class. A number of different exercises are possible. Three strategies that worked well in previous READI courses are described below.

A. Introductory Computer Activity — The purpose of this activity is to get people started on the computer as soon as possible. Since many of them will have never touched a computer, their focus on entering the class will be on getting their hands on the machine as soon as possible. Providing an opportunity for them to do so immediately will relieve some anxiety, as well as give early arrivals something to do while they are waiting for the class to start.

1. Choose an easy-to-use piece of software that requires little or no instructions.

Previous READI classes have used public domain programs such as Othello or Bagels, the Lemonade Game, Apple Presents Apple, and homemade programs that ask several questions of participants and print out a response for participants' initial contact with the machine. (A printout of one such program for the Apple is included.)

2. Boot up software and test to make sure everything is working properly.
3. Invite participants to sit at a machine as they enter the classroom. Help them get started. You may need to have more than one program available to keep those who come early from getting bored.

B. 4-Square: An Introductory Warm-up — The purposes of this exercise are to provide participants with an opportunity to get to know each other, to speak in the class and to develop a list of participants' expectations.

1. Make up sheets of paper or cards with 4 squares. Label them as follows (or make up your own questions):
 - Upper left: What are you called?
 - Upper right: What do you do?
 - Lower right: What do you expect from this course?
 - Lower left: Computers are _____.
2. Give each participant a sheet and several minutes to fill it out.
3. After the sheets are completed, ask participants to find a partner they don't know well and to share their answers with this person.
4. Have the partners introduce each other by sharing some of his/her responses with the group.
5. As each person speaks, list the expectations mentioned on newsprint.
6. After everyone is finished, ask for additional expectations to add to the list.
7. Provide an overview of READI and the Unit I curriculum describing how participants' expectations will be met.
8. Review the list and identify any expectation that will not be met in the course and suggest other resources where possible.

C. Combining 4-Square with an Introductory Computer Activity

1. Write a program that will allow participants to enter their answers to the 4-square questions in the computer and then provide them with a printout. Or find a data base, such as Appleworks, that will allow you to easily print out the monitor display or a single record. Set up the data base to include the 4-square questions. Continue with instructions for Introductory Computer Activity.
2. Continue with instruction 3 above.

2. Overview of the Course

A second overwhelming concern for new participants is finding out what this class will be like and whether it will meet their needs. They will also have some concerns about who you are and what qualifications you have. In order to provide them with the information they need, the following items should be included in your introduction to the class.

A. An Overview of READI — READI was developed because rural people have a great deal of interest in computers, but often no access to resources to learn about them. The READI program was developed under a grant from the Fund for the Improvement of Postsecondary Education in cooperation with the Idaho Cooperative Extension Service and the University of Idaho. The materials, class design and peer teacher training program were piloted in Idaho in 1983-1985.

The READI Project provides materials and resources to local communities which set up their own program, recruit students, set fees, and select teachers. If you are interested in learning more about the local committee or getting involved in the program's operation, contact: _____

- B. Your Background** — Describe how you got involved in the project and what background you have in computers.
- C. READI Offers Two Classes** — Unit I, which is this class on introduction to computers, covers the basics of using computers and software. Unit II, which will be offered here at a later date, focuses on computer applications including data bases, electronic spreadsheets, word processing, and electronic communications.
- D. The READI Approach to Computer Literacy** — The pilot study of the project showed that adult students learn best when they are actively involved in the learning process. Therefore, this class will include very few lectures or presentations and will instead focus on hands-on activities and discussions. We will spend some time at the end of each session discussing what people have learned. In addition, some time will be given to evaluating that session so we can improve the sessions as we go.
- E. Participant's Manual** — Each person has been given a participant's manual. This manual provides background information and summarizes the main points of each session. Some sessions will follow the manual closely, while in others we will only touch briefly on the material provided. Each session also includes a log sheet and a worksheet. We will go over the worksheets in class, but the log sheet is there for you to use to keep track of your feelings, questions, notes, etc.

3. Agenda Review

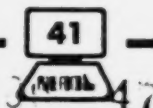
See Leaders Guide

4. Guidelines for Introducing the Computer

One of the most overwhelming things facing new computer users is the number of new terms and concepts to learn. It is important to begin helping people familiarize themselves with this new language as soon as possible because the ability to name things is critical to developing confidence. However, vocabulary by itself can be boring, so it is important to combine the introduction of terms with demonstrations and examples.

Beyond teaching people new terms, this activity should also help people understand relationships among various computer components and introduce the basic concepts of operating systems, disk handling, ROM and RAM and cursor control.

- A. Name and Explain the Hardware Components** — Participants can follow along by referencing the material on computer components in the Participant's Manual, Session I. In your demonstration include computers, monitors, printers and, if possible, modems.
- B. View Inside of the Computer** — If possible, remove a computer's cover, so people can see inside the machine. Identify the slots and cards, so participants can see how the computer communicates with the printer, monitor, etc.
- C. Explain the CPU, Memory Including RAM and ROM and Inputting and Outputting Data** — Provide some examples in your explanation. For example, instructions for performing math operations reside in ROM. Programs written for a particular software package are loaded into the RAM. This is a good opportunity to give participants a



chance to see an owner's manual. Go over the rules for using the equipment (i.e., no food or drink) and on/off switches, etc.

- D. Describe and Demonstrate Software** — Explain how the computer reads the program located on the disk. Show an example of a user's guide to explain this component of software systems.
- E. Describe a Diskette** — Show the class a diskette, describe it, and explain the rules for taking care of diskettes.
- F. Demonstrate Loading a Program** — Explain the following concepts: loading, booting, saving, and crashing. Put instructions for booting a disk on newsprint or the blackboard. Encourage participants to write them down for later reference.
- G. Have Participants "Boot a Disk" with Some Easy-To-Use Software** — Have several kinds available and allow participants to work with the machine for some time. A program like Animal is useful here because it makes it clear that the computer is only as smart or as correct as the person who provides it with data.
Recommended Software:
 - 1. Crosswork Logic
 - 2. Print Shop
 - 3. Animal or Lemonade from Apple's Demo Disk
 - 4. Public Domain
 - 5. Appleswap Disks #1-9
- H. Have Participants Return to Discussion Groups** — As participants return to the discussion group, have them think about what they have learned about computers. Brainstorm a list of what people have learned. Discuss. Use this time to point out that the machines are only as right as the person who inputs data, that machines need specific instructions and information, and that each program is limited in its application.

5. Learning List

See Leader's Guide

6. Wishes and Pluses

See Leader's Guide



Session II

Task Operating Systems

This session really has two purposes. The first is to introduce the idea of the computer as a problem-solving tool. In order to do this, it is important to review what problem-solving is and the steps that go into solving a problem. Since the process may appear a little abstract, have people start with thinking about a successful problem-solving experience of their own. You may wish to have them write down and share a recent successful problem-solving experience and then perhaps write about a problem they have difficulty solving. In any case, the study of problem-solving needs to be both as concrete and as relevant to their everyday experiences as possible.

The second and related task is to introduce programming. While many educators do not see the need for teaching people about programming, the experience of this project indicates that this is an extremely important, albeit difficult, part of the curriculum. You will have to decide how much time you want to spend on programming. If most of your participants want to learn programming, there will be a great deal of interest in this section. If, on the other hand, your participants are more interested in specific applications, you will want to go over the major points briefly and use some of the time allocated for programming on spreadsheets and data base. Programming has been important in this project because the ability to program a very simple task increases confidence and comfort 100%. Secondly and equally important, successfully programming a simple task and eventually revising it provides the best demonstration possible on how computers process information. Programming shows that the organization of the information to be programmed determines the ability of the computer to process that information and to output the result of that processing in a way that is useful to the programmer. This session is also the place to first introduce the idea that any work to be done on the computer should be done first by taking up paper and pencil.

It is the relationship between organizing information, processing it, and applying the results to a task that provides the bridge between programming and problem-solving. It will be important, however, for you to provide real life examples that make the bridge work if your participants are to understand this relationship.

Session II

Overview

Objectives

- To introduce problem-solving as a process that is useful in learning about computers as well as in everyday life.
- To increase participants' understanding that the successful use of computers requires properly defined tasks and well organized information.
- To provide each person with a successful experience in programming a computer to perform a defined task.

Competencies

READIness Skills:

1. Understand the problem-solving process.
2. Use problem-solving strategies for taking it apart and acting it out (see problem-solving strategies in participant's manual).

Computer Skills:

1. Be able to initialize a disk and to save, copy, load, and run a program.
2. Understand what a disk operating system is.
3. Write a simple program.

Pre-Class Tasks

1. Write or find several short programs for people to use when they have finished developing their own.
2. Develop a relevant example of problem-solving, one that participants can identify with.
3. Make newsprint lists of instructions for activities and for the agenda. Also make a list of tasks that are easily programmed for handy reference.
4. Find or develop a program like a guessing game that can be easily modified.
5. Develop good discussion questions and examples.
6. Write up the information for developing Hello programs with the computer you are using. Post or make copies to pass out.
7. List the main commands people will be using on newsprint or make handouts so participants have some reference as they work.

Sample Agenda

Time	Activity	Materials	Comments
Pre-class program	Terminology Quiz	Software	See appendix for listing
15	Computer Component Role Play: explain activity, assign roles, do role play, debrief	Signs	

Sample Agenda (cont'd)

Time	Activity	Materials	Comments
5	Session I Review Agenda Review	Newsprint	
30	The Operating System:		
(5)	Explain operating system: handout or post-instructions for loading, initializing, and saving	Handouts or Newsprint	
(5)	Demonstrate a HELLO program	Operating System	
(20)	Participants use operating system by writing a HELLO program, saving, copying, and running a program	Diskettes Instructions for HELLO program	
10	The Problem-solving Process: Why problem-solving is important to computer use, brainstorm strategies for problem-solving, explain process and strategies sheet in manual, problem solving and programming explanation and demonstration	Newsprint Example on newsprint.	
10	Break		
70	Learning about programming		
(15)	Presentation on programming	Main commands on newsprint	
(5)	Demonstration of control keys	Control keys on newsprint	
(15)	Write a program	Sample program on newsprint	
(35)	Enter and run program	Initialized diskette	
5	Learning List	Newsprint	
5	Evaluation		

Activities Description

1. Warm-Up

READI classes have used several different warm-ups for this session. We have included two different warm-ups here for you to choose from, or, using the guidelines in the Leader's Guide on warm-up selection, develop one of your own. Warm-up A serves to review what was covered

in Session I and, at the same time, gets the class going. Classes where the facilitator was uncomfortable with role plays used Warm-up B.

A. Computer Component Role Play — (see Leader's Guide for information on Role Playing) Role plays are effective learning tools because they allow people to act out processes or events. Asking participants to role play the relationship of computer components can help them better understand what those components do and how information is passed from one to another.

1. Make up signs for each of the components, processes, or concepts discussed in Session I. Include a sign for the user. You may decide on a sign for each participant and an "owner's manual" sign for yourself.
2. Hand out the signs to participants.
3. Ask the user to put the components together and then to boot up a program. As the program is being loaded, run, printed, and saved, have participants identify where and how the information is being processed, input, and output.
4. Debrief the exercise by asking participants to comment on being part of a role play, as well as by asking for questions or comments on how computer systems handle information.
5. Classes that have used this warm-up often have good discussions clarifying a number of different concepts.

B. Problem-solving Experiences — A common and effective warm-up is to have participants share an experience, idea, or concern in small groups if you have a large class or in one big group if you have 12 students or less. The purpose of using a warm-up like this for Session II is to get people thinking about the problem-solving process and problem-solving strategies they use every day.

1. Ask participants to think of a problem they recently solved. Examples of problems might be balancing a checkbook, finding a bookkeeping error, helping a child with homework, fixing something, etc.
2. Have them write out the steps they went through to solve the problem and the strategies they found most helpful. As a word of caution, many people have difficulty thinking through the solution to the problem, so you may want to use the following example or one of your own.

Solving a Problem — Balancing a Checkbook:

- a. Describe the problem. My checkbook differs \$40.00 from the balance the bank has.
 - b. Ask several members of the class what they would do and list their strategies on the board.
 - c. Discuss the strategies and point out the following:
 - People have different methods of solving problems.
 - No one way is right.
 - You need to know when the problem is solved.
3. After about 5 minutes, ask them to share their examples with others in the group. List strategies on newsprint.

2. Agenda Review

See Leader's Guide

3. Review Session I

(If you use Warm-up B, do the review first so you can proceed from the warm-up to the problem-solving activity.)

4. The Operating System

(If you use Warm-up B, do this activity after #5, but before participants begin working on the machines.

(Refer to the participant's manual and your user's guide for background information.)

Helping participants understand the operating system is a very important, but often overlooked, part of learning to use a computer. Spending some time with your class helping them to understand what the system does will help them be more effective and confident computer users.

- A. Explaining and Identifying an Operating System** — Explain what an operating system is and identify the operating system used with your machines. This is an excellent time to introduce participants to the user's guide for your machine.
- B. Formatting** — Explain the concept of formatting or initializing a disk and that disks can be initialized with an applications program or by writing a Hello program.
- C. Explaining Hello Program** — Handout instructions for writing a Hello program for your machine or put instructions on newsprint. Explain the components of this simple program, e.g., line numbers.
- D. Loading an Operating Disk** — Have participants load the operating system so they will be able to save the programs they write.
- E. Writing Hello Program** — Each person should write a Hello program and initialize a disk.
- F. Working with a Program** — Demonstrate how to copy a program and have participants copy a public domain program on their disk; load and run the program.

5. The Problem-Solving Process

Difficulties with using problem-solving skills have been identified as a major reason for functional illiteracy among American adults. Each of us has our own method for solving problems, but some of us have more difficulty with problem-solving than others. Since problem-solving is a learned skill and one that is required in all aspects of computer use, it is important to review both the process of and strategies for problem-solving.

- A. Introducing Problem Solving** — Introduce this activity on problem-solving by explaining the importance of problem-solving to computer use. Programming and many applications programs assume the user has some problem-solving skills. In addition, users often find themselves with perplexing problems when programs get lost, printers don't work the way they are supposed to, or programs don't do what you want them to do. Problem-solving skills are essential to working one's way through these setbacks.
- B. Using the A and B Warm-ups** — If you used Warm-up A, begin the discussion on problem-solving by having people share examples of successful problem-solving through

a sharing exercise such as that described above or by brainstorming strategies they have used to solve problems. If you used Warm-up B, ask participants to brainstorm additions to the list of strategies developed during the warm-up. Refer to the chart included in the participant's manual. Boxes for each session are included for those who want to keep track of the problem-solving strategies used during the class. There is also some room for additional strategies to be listed.

- C. **Demonstrating Problem-Solving** — Using the blackboard or newsprint, demonstrate the problem-solving process described in the participant's manual.
- D. **How Problem-Solving Helps with a Programming Problem** — Using the simple example, show how the problem-solving process can also be used to help with a programming problem.

Problem-solving Process

1. Define the problem
2. Search for strategies
3. Plan ways to solve problem
4. Carry out plan
5. Assess results

Programming Example

I want a program that computes my miles per gallon.

I need to use a formula that divides my mileage per tank by the gallons I used to get miles per gallon.

My program will have to let the user input miles and gallons. It will output mpg.

My program: Develop program for your computer, explaining the commands, line numbers, etc., as you go. For example:

```
NEW
Input miles
Input gallons
Let R = MPG
Print R
END
```

Run the program to see if it works. Use the process to make revisions.

6. Learning About Programming

Programming requires learning to use a language that the computer recognizes. Explain some of the components of BASIC using examples. When participants are working at the machines, you will need to circulate to provide assistance. If you have someone who has experience programming with the type of machine you are using, you may wish to have them assist you for this session because you are likely to have many questions as people work with the machines.

A. Introduce the Session on Programming by:

1. Briefly describe programming as a method of communicating with computers, a method that requires precise, exact information.
2. Briefly talk about when programming is helpful, i.e., repetitious tasks that fall into a pattern. Have the group brainstorm some ideas of tasks that could be programmed. Select one and as a group write a short program.

B. Develop a Presentation on Programming that Includes the Following:

1. Commands assign value, tell the computer to input or output data, or control the flow of the program. Use the example from above to demonstrate commands. Demonstrate commands such as GOTO, IF THEN, LET, INPUT, PRINT, etc.
2. Explain variables. Use the example above to illustrate numeric variables. Alphanumeric variables or string variables can be demonstrated by showing how computers would say hello using a person's name. (Input \$N, Print \$N)

C. Using the Example in #5, to Explain the Function of Line Numbers.

D. Explain the Control Keys and Commands — On newsprint or handouts, explain the control keys and commands for scrolling, stopping a program, clearing a screen, and loading, running, and saving programs.

E. Write a Program Using the Problem-Solving Process — Have participants work with a computer partner to write a program using the problem-solving process as a guide. Programs should be written out on paper before they work at the machine.

F. Key In Program, Run, and Revise — Have participants key in their programs, run, and revise them. Participants can then try out each other's programs.

G. Work with Other Programs — When participants finish with their programs, they can work on others, or you may wish to have written programs they can key in and try out. For example, people might be interested in the endless loop program that prints the same thing over and over for wrapping paper or messages.

7. Learning List

See Leader's Guide

8. Evaluation

See Leader's Guide



Session III

Calculating with a Computer

One purpose of this session is to review basic math. It will provide an opportunity for people to brush up on their skills, as well as to recognize that computer technology does not do away with the need to have good math skills. The session has been designed to make the math review as productive as possible by using many group activities and structured settings. The class experiences should help people overcome math and computer anxiety, not add to it.

The session also increases participants' ability to control the computer by providing practice in the immediate mode and particularly by helping people understand the importance of how numbers are put into the machine. Since the machine cannot know what we want from it, we must be able to estimate the outcome so we will know when it is time to do some troubleshooting.

Overview

Objective

- To provide an opportunity for students to review their basic math skills, to increase their mastery of the computer as a tool.

Competencies

READIness Skills:

1. Use problem-solving strategies including making a list, making a guess, estimating an answer and translating a problem.
2. Use different orders of operations.
3. Practice basic math operations with whole numbers, decimals, and fractions.
4. Learn several different estimation skills and practice at least one.
5. Understand and use exponents.

Computer Skills:

1. Perform calculations on the computer.
2. Know the order of operations on the machine used in class.
3. Understand how the computer being used displays exponents.

Pre-Class Tasks

1. Develop number and word problems on cards.
2. Put agenda and instructions on newsprint.
3. Have problems ready to illustrate order of operations and use of exponents.
4. Have additional software available.

Sample Agenda

Time	Activity	Materials
Pre	Terminology Program	Software
20	Warm-up: Programming Puzzle	Puzzles
(5)	Explain activity and pass out puzzles	
(10)	Small groups work on puzzles	
(5)	Debrief	
5	Review of Sessions I & II	
5	Agenda Review	Newsprint
15	The Importance of Estimating Skills	
(5)	Presentation	
(10)	Practice	Worksheet or problems on newsprint
30	The Computer as Calculator	
(5)	Brainstorm math uses	Newsprint
(5)	How to use computer/spreadsheet as a calculator	Commands on newsprint
(20)	Demonstration	
10	Break	
30	Using the Computer to Solve Problems	
(5)	Explain exercise	
(20)	Word problem practice	Word problems
(5)	Debrief	
20	Planning for Panel Discussion	
(5)	Brainstorm types of computer uses	Newsprint
(10)	Discuss	
(5)	Identify local people	
10	Learning List	Newsprint
5	Evaluation	Newsprint

Activities Description

1. Warm-up

A. Programming Puzzle — Use this activity to begin the class session and to review Session II.

1. Using a simple program, cut the program into lines.
2. Break the class into several small groups.
3. Give each group a copy of the cut up program. Have groups put the program back together correctly.
4. Discuss the exercise. Is there more than one correct way to put the program back together?

B. Doing Math on the Computer

1. Boot up a math program.
2. Have participants work on the program as they come into class.
3. Debrief by discussing reactions to the programs and to the math exercises.

2. Agenda Review and Review of Previous Sessions

3. The Importance of Estimating Answers

Computational estimation is a very important and useful skill, particularly since the advent of computer power. The successful use of computers requires some estimation skills as a check on the computer's output. A recent estimate of errors in executives' spreadsheets indicated that at least 25% contained major errors that had gone undetected. Estimating answers is a very effective tool for ensuring the accuracy of computer outputs.

A. Prepare a Chart of Estimation Strategies on Newsprint or the Blackboard.

- B. Presentation on Estimation Strategies** — Prepare a presentation on estimation strategies using the information in the Participant's Manual. Using common problems such as:

$45 + 95$	$1,589 - 423$	$1,091 \times 12$	$804 \div 21$
$2.21 + 98.12$	$234.9 - 12.45$	$12.23 \times .93$	$12.12 \div .93$
$6\frac{3}{4} + 4\frac{1}{8}$	$12\frac{3}{4} - 8\frac{1}{2}$	$6 \times \frac{2}{3}$	$6 \div \frac{2}{3}$

Have participants talk about the strategies they would use to estimate the answers to these problems.

- C. Estimating Answers and Adjusted Estimates for the Front Number and Nice Number Strategies** — Introduce the idea of estimated answers and adjusted estimates for the front number and nice number strategies (see chart in Participant's Manual). The estimated answer would be the result of performing the indicated operations on the front numbers or with the nice numbers. The adjusted estimate would modify that number plus or minus based on the number(s) following the front number or on whether the number is more or less than the nice numbers used in the estimate. For example, with problem $1,234 \times .94$, the estimate would be $1 \times 1,234$ and the adjusted estimate would be less than 1,234, because .94 is less than 1.
- D. Using the Front Number Strategy** — The front number strategy is one of the easiest to use and can be quite helpful. Make a list of problems beginning with fairly simple equations, but including problems with decimals, fractions and word problems. Work through several with the group. Then, have the group estimate the answers themselves, discussing each as you go through your list.

4. The Computer as a Calculator

The purpose of this activity is to give participants an opportunity to use the computer in immediate mode, to review some math, and to illustrate the importance of knowing the order of operations the computer is using.

- A. Brainstorm Tasks that Use Math Skills** — Begin this activity by asking participants to brainstorm everyday tasks that use math skill. Discuss the list and how the computer can aid in these tasks.

- B. Using the Immediate Mode** — Explain how the computer works in immediate mode, how to use print statements in immediate mode, how to control the cursor, and any other relevant commands. (To some extent, you will be reviewing Session II here.)
- C. Using Spreadsheets** — Boot up a spreadsheet on several of the computers. Explain cursor control and other pertinent commands for those using the software.
- D. Work Some Math Problems on the Computer** — Make a list of problems on newsprint or use the list on the Session III worksheet. Have participants work with their computer partner to predict the answers and then enter the equation into the computer. Compare estimates and answers.
- E. The Order of Operations** — As the problems become more complex, estimates will vary and the answers given by the computer in immediate mode are likely to differ from those of the spreadsheet. Use the experiences of the class to discuss and explain the concept of ORDER OF OPERATIONS. Have participants describe the order of operations they are using. (Most computers will multiply or divide first, then go back and do the adding or subtracting. Most spreadsheets will perform each operation in order.)
- F. Parentheses in Math Problems** — Explain the use of parentheses in writing out math sentences and provide some examples.
- G. Exponential Notation** — Briefly explain exponents and describe the exponent notation used by your computers. Give the group several problems that illustrate the use of exponents.

5. Using the Computer to Solve Problems

The purpose of this activity is to give participants additional practice with the machine and doing math problems.

- A. Making Up Word Problems** — Make up several word problems and number sentences. Write them on cards so there is one card for each set of computer partners. Or have half the participants make up word problems related to everyday activities while the other half makes up some number sentences.
- B. Translating Word Problems** — Have participants work on translating the word problems to number sentences and vice versa. These translations should be done on additional cards or stick-on sheets that can be attached to the top of the original card. Participants can then pass them on to the next group for translation back to either a number sentence or a word problem. Pass the cards again with the new translation on top and have it translated again if there is time.
- C. Examining Various Translations** — Have participants examine the various translations and use the computer to solve the problems and number sentences.
- D. Discuss: How did they like the activity? What did they learn from it?**

6. Planning for the Panel Presentation

The class should be as involved as possible in setting up the panel discussion for Session VII.

- A. Brainstorm Types of Computer Uses or Users** — For example: teachers; business people who have computerized, such as retail sales, bookkeepers, sales representatives, etc.; professional people who use computers, such as extension faculty, doctors, lawyers, writers, etc.; a representative of a local user's group; and home users.

- B. Discuss the List and Prioritize the Users or Uses in Which the Class Is Most Interested.**
- C. Invite Local People to Come Talk About Computers** — Identify local people who may be interested in coming to the class to talk about computers. Decide who will offer the invitation. Invitees should be encouraged to bring examples of their applications, software, and, if possible, hardware.

7. Additional Activities

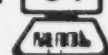
Some READI classes finished this agenda very quickly, so you will probably want to have additional math programs and/or spreadsheet templates available for people to work on. Your local school or college can be a resource for acquiring public domain programs and your local extension office may have some spreadsheet templates that will be of interest to your group.

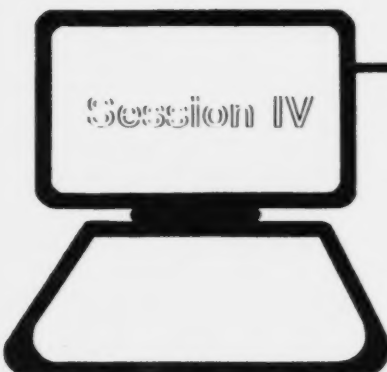
8. Group Sharing: How Will You See What You Learned?

See Leader's Guide

9. Evaluation

See Leader's Guide for suggestions.





Session IV

The Computer as a Problem-Solving Tool

This session is intended to put together all of the skills developed in previous sessions. Several methods for doing this are possible. You may wish to have participants work on a programming task. You can

also have the group work together on a more complicated task, such as the guessing game developed by Kyra Rolstad. In both of these cases, you will want to go over the importance of organizing the work prior to interacting with the computer. Both top-down programming and flow charting are ways to do this. Participants can use sub-routines for different steps or sub-steps of the problem-solving process.

In some READI classes, the majority of people preferred to apply their new skills to something other than programming. In this case, you may want to introduce spreadsheets using an example that applies the problem-solving process as well as the math they have reviewed. Some of the public domain or extension programs would also be helpful here. Whatever you do, don't just give them a bunch of disks to work on, but structure the activities to guide the software use, so it is clearly a learning activity.

Overview

Objectives

- To increase the ability of participants to use the computer as an aid in problem-solving.
- To enhance their skills in programming.

Competencies

READIness Skill:

1. Use the problem-solving strategies of making a diagram, picturing the problem and following directions.

Computer Skills:

1. Understand what a flow chart is and why programmers use them.
2. Understand top-down programming.
3. Successfully write a program using one of these techniques.

Pre-Class Tasks

1. Put agenda and instructions on newsprint.
2. Have materials ready for the flow chart example.
3. Find additional programs for people to key in or develop a presentation introducing spreadsheets.
4. Put together notes on computer history and technology in Idaho for your lecturette. Think about how you will emphasize the important points.

Sample Agenda

Time	Activity	Materials
Pre-class	Terminology Review, Practice with other software	Program software
20	Warm-up: Following directions	
(2)	Explain exercise	Items for
(5)	Participants write directions	following directions
(8)	Act out directions	
(5)	Debrief	
5	Agenda Review	Agenda on newsprint
5	Review previous sessions	
50	Flow Charts and Top-down Programming	Newsprint
		Operating system master
(5)	Presentation disk	
(10)	Demonstration	Additional software and
(30)	Participants do programming	program listings
(5)	Debrief	
10	Break	
15	The Development of Computers	
(5)	Brainstorm inventions leading to the computer	Newsprint
(10)	Discuss	
35	Computers and Change in Idaho	
(5)	Brainstorm changes	Newsprint
(20)	Make a web chart of one change	Newsprint
(10)	Discuss	
5	Learning List	Newsprint
5	Evaluation	Newsprint

Activities Description

1. Warm-Up: Following Directions

The purpose of this warm-up is to help participants recognize the importance of organizing their work in proper sequence and of including all the necessary steps.

- A. Writing Directions for a Specific Task** — Have participants write down directions for a task, such as putting on a coat, making a peanut butter and jelly sandwich, or putting on shoes and socks. This activity works best with everyday tasks that we take for granted.
- B. Acting Out a Task According to Directions** — Either you or a volunteer should act out a set of instructions. Generally, people do not give precise directions, so if you follow what they have written precisely it will be pretty funny.
- C. Debriefing** — Debrief by discussing the importance of writing complete instructions.

2. Review Session III and Answer Any Questions

One reviewer suggested that several estimating problems be included in the session review. They are included on a worksheet.

3. Agenda Review

See Leader's Guide.

4. Lecturette on Flow Charts and Top-Down Programming

A. Review the Information in the Manual on Flow Charts and Top-Down Programming.

B. Define Concepts — Define each concept for the class and give examples. You may want to design a program ahead of time that can be used as an example in your presentation. The guessing game developed by Kyra Rolstad is one possibility.

C. Use Problem Solving to Formulate a Problem Statement — With the guessing game or some other problem, use the problem-solving process to formulate a problem statement, flow chart the activities, and discuss sub-routines. The discussion should include information on loops.

D. Develop a Program on a Problem — Have participants work with their computer partner to develop a program on a problem of their choice. They may choose to modify the guessing game or your example.

E. Debrief

5. The Development of Computers

The home computer merges several historical trends in electronics and communications, including inventions in writing, printing, telephone communications, transistors, adding machines and calculators. Refer participants to the information sheet in the manual, but focus discussion on events in the development of computers.

A. Introducing Activity — Introduce this activity by mentioning that the ability of the computer to process data is the result of a long history in the development of communications technology.

B. Brainstorming — Brainstorm a list of some of the inventions that led to the micro computer.

6. Computers and Change in Idaho

In addition to discussing how communications technology has changed, it is important for participants to discuss how changes in that technology will affect themselves and their communities. Brainstorming a list of changes will illustrate the degree to which computer technology has affected their lives. Using a Web Chart to discuss the implications of change will help participants examine some of the wide-ranging effects of change.

Guidelines for Using Futuring Wheels

Futuring wheels, sometimes called web charts or spider graphs, are an effective tool for helping people think about consequences or implications of change. They provide a group with the opportunity to think beyond immediate consequences and to look at both the potential positive and negative effects of change. (See the example on the following page.)

1. Begin by brainstorming concrete changes created by the introduction of computers.
2. Choose one example from the list of changes developed by the group. Write this example in the center of a large piece of newsprint.
3. Have the group brainstorm the possible immediate consequences of the examples they have chosen. List these possibilities around the example.
4. Next, examine these immediate consequences or implications and brainstorm the consequences of each. Draw lines to connect related events.
5. Continue with third and fourth level consequences. As you move out from the center of the chart, consequences will tend to be more abstract and global.
6. For each item listed try to include at least one positive and one negative consequence.
7. The future wheel explores possibilities, so any suggestion, however unlikely, is acceptable.
8. Prompt the group with questions like: What kinds of things might happen right away as a result of this change? What will this change mean for workers and/or consumers?
9. Futuring with a future wheel works best if general discussion is postponed until after the wheel is complete. Some discussion is, however, important to generating ideas.
10. With most wheels you will have some consequences repeated. These can be listed separately or linked together with lines (see example).
11. In addition to repetition, the brainstorming will generate contradictions in potential consequences. These contradictions can generate some excellent discussion as participants talk about the factors that will determine the outcome.
12. Some consequences or implications of consequences appear to be circular. For example, less jobs — less tax money — less jobs — less tax money. These "feedback loops" can also generate good discussions.

7. Additional Programming Activity

You should have additional programs for participants to key into the machine or work with if they finish before class is over. *Family Computing* is a good source of programs. Also, some READI classes have used part of this session to introduce spreadsheets.

8. Learning List

See Leader's Guide.

9. Wishes and Plusses

See Leader's Guide.

Flow Chart — Example

Computer Guessing Game

This program will lead into a computer guessing game.

```
100 PRINT "what is your name?"
110 INPUT N$
120 HOME
130 ? "I'm thinking of a number between 0 and 100"
140 GOSUB 1000
150 ? "Please type in your guess"
160 INPUT R
170 IF N=R then 300
180 IF R is less than N then? "Sorry, your number is too small."
190 IF R is greater than N then? "Sorry your number is too large."
200 ? "Please try again"
210 GOTO 150
300 ? "Nice job"; N$ "would you like to try again?"
310 INPUT A$
320 IF A$="Yes: then 120"
330 ? "Goodbye"
340 END
1000 REM SUBROUTINE to pick a number
1010 Let N=RND(1)
1020 Let N=INT(N*100)+1
1030 RETURN
```

Several changes can be made to improve it. Adults enjoyed modifying it.

Example: Count number of tires (put in counter 165 let C=C+!, 125 let C=0)

Example: Change to erase guess so student must remember what number they have used (205 HOME).

```
100 REM FLASH CARD
110 Let X=RND(1)
120 Let Y=RND(1)
130 Let C=1
140 Let X=INT(X*10)+1
150 Let Y=INT(Y*10)+1
160 HOME
170 VTAB(15): HTAB(20)
180 PRINT X;"*";Y;"="
190 INPUT A
200 Let B=X*Y
210 IF A=B then HOME: VATB(15): HTAB(10): ? "GREAT": FOR T=1 to 160:
    NEXT T: HOME: GOTO 100
220 Let C=C+1: IF C is greater than 3 then 240
230 PRINT "NO. Please try again!"
    FOR T=1 to 1600: NEXT T: GOTO 1600
240 PRINT "This problem is too hard. The answer is ";B;". Lets try another
    problem.":For T=1 to 3000: NEXT T: GOTO 100
```

Sample Word Problems/Number Sentences

1. If your checkbook balance was \$375 and you wrote additional checks for \$46, \$25, \$42 and \$89, what is your new balance?
2. If a number is added to itself 2 times, the sum is 87. What is the number?
3. Joe had 58 apples. He sold twenty-five percent. How many apples did he sell?
4. If eggs cost two cents each, how much would one thousand eggs cost?
5. The second grade can earn some money to buy computer software. The teacher has ordered 485 boxes of candy to be sold. Each box will yield a profit of \$1.20. There are fifteen boys and five girls who are eager to become salesmen. How will the teacher divide the candy equally among the children? How much money will the class realize from this profit?
6. If FICA tax equals 5.85% of your gross income, federal unemployment tax is 0.5% on the first \$4200 and state unemployment tax is 2.7% on the first \$4200, how much would be taken from you earnings if you made \$4759?
7. A family's after-tax income is \$8000 annually. If it plans to spend no more than 25% on housing, 20% on food, 10% on transportation and 5% on savings, how much can it allow for clothing, recreation and education?
8. If my new outfit cost \$38 and I got it at 30% off, how much was it originally?

Kyra Rolstad's Programming Role Play

The next warm-up idea is excellent for the programming section later in READ I and READ II. The original was confusing, so I rewrote it to add clarity.

It needs 4 people: Keyboard, Screen, Memory, and Processor.

1. The Keyboard reads numbers from a given list. When a number is read, an X must be placed by that number.
2. Screen needs a board to write what is told to it by the Processor.
3. The memory has 4 squares numbered by a number in the corner. When told to write a number in the box, cross out anything (except box number) written in that square.
4. Processor has a scratch pad to help keep track of numbers. If a new number is given to you, cross out the old number and replace it with the new number.

Processor's Directions:

1. Tell Memory to write a zero in box 1.
2. Ask Keyboard for first number on list.
3. Instruct Memory to write that number in Boxes 3 and 4.
4. Ask Keyboard for next number and write on scratch pad.
5. Tell Screen to print number on screen.
6. Ask Memory for number in Box 1.
7. Add to number on scratch pad and replace with Screen.
8. Tell Memory to write that number in Box 1.
9. Ask for number in Box 4.
10. Subtract one and tell Memory new number for Box 4.
11. If the number in box 4 is not 0, go back and start with instruction #4.
12. Ask Memory for contents of Box 1.
13. Tell Screen to write "The total is" followed by the number.
14. Ask Memory for contents of Box 3. Divide that number by the number on the scratch pad.
15. Tell the Screen to write "The average is" followed by the number.
16. STOP.

The next step is to write a program that demonstrates these steps:

```
10  Let B1=0
20  READ N
30  Let B4=N
40  Let B3=N
50  READ N
60  ?N
70  Let B1=B1+N
80  Let B4=B4-1
90  Let IF B4 is greater than 0 then 50
100 ?"The total is;"B1
110 ?"The average is;"B1/B3
120 DATA 3,6,11,7
130 END
```

This activity forces people to break down the problem into simple steps.

Methods of Teaching Computer Literacy

Supplementary Materials for READI Training
Kyra Rolstad, Timberline High School

I will share some programs we used to demonstrate programming skills and include some warm-up activities our classes enjoyed using during the READI classes.

The first session teaching information on programming will aid the user in understanding the function of basic statements, so if they want to modify existing programs for their own use, it won't seem as difficult. I employ discovery activities.

Example 1: Entering String Variables and Numeric Data.

```
100 Let A=1
110 Let A$="House"
120 Print A
130 Print "A"
140 Print A$
150 Print "A$"
160 End
```

This shows types of variables and how to print values.

Example 2: (New: Home)

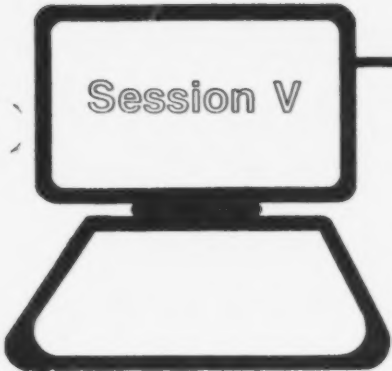
```
100 Let A=1
110 Let B=8
120 Let C=B+A
130 Print C
140 End
```

An interesting activity is for the adult to type the program in backwards, i.e.: line 140 END, 130 PRINT C, etc., and discover how the computer sorts out statements and displays them in order.

Example 3: Transfer Statements

```
100 INPUT N
110 ?"Type a number smaller than";N
120 GOTO 100
130 END
```





Session V

Word Processing

With this session you will be introducing the first application program. Word processing is probably the most widely used computer application. It is important, however, to recognize that teaching about word processing necessarily involves teaching about writing. The "writing as a process" approach introduced in this session helps people learn more about writing in general and themselves as writers in particular.

Two general problems crop up with writing. Many people cannot get started, and much of the time the writer does not communicate effectively with the reader. The writing as a process approach provides participants with some techniques for overcoming writer's block, as well as insights into the development of clear writing. Since writing anxiety is often a block to using word processing, the goal for this session is to give participants a positive writing experience on the word processor that provides them with the incentive to use it further.

Overview

Objectives

- To introduce participants to what a word processing package can do.
- To introduce participants to the "writing as a process" approach to improving writing and communication skills.

Competencies

Computer Skills:

1. Enter data into a word processor.
2. Use basic word processing functions.

READIness Skills:

1. Understand free writing and writing as a process.
2. Practice writing skills.

Pre-Class Task

1. Put agenda and activity instructions on newsprint.
2. Purchase oranges.
3. Develop template for word processing activity.

Sample Agenda

Time	Activity	Materials	Comments
Pre-class	Terminology Review Work with word processor	Software	
30	Oranges		
(5)	Explain activity and word processor functions	Oranges	Have participants work with a typing tutor
(15)	Participants write about oranges and print out description	Software	
(5)	Exchange description and find oranges		
(5)	Debrief		
5	Review previous sessions		
5	Agenda Review	Agenda on newsprint	
5	Planning for Panel Discussion		
10	Overview of the Writing Process	May want to put process on newsprint	
(5)	Presentation	newsprint	
(5)	Brainstorm pre-writing activities	Newsprint	
45	Word Processing	Newsprint	
(5)	Overview of Software		
(5)	Demonstrate loading program and files	Commands on newsprint	
(15)	Participants practice with simple files		
(15)	Participants write a letter		
(5)	Debrief		
10	Break		
35	Using a Word Processor/Free Writing: Presentation on Word Processor	Newsprint	
(5)	Brainstorm writing ideas	Newsprint	
(5)	Review rules for free writing	Rules on newsprint	
(10)	Free writing	Software	
(10)	Small group sharing		
(5)	Debrief		
5	Evaluation		

Activities Description

1. Warm-Up

Two very different warm-up strategies have been used in READI classes. Booting up a typing tutor program can help people get used to the keyboard before working with a word processing program. For people who are poor typists, it can, however, increase their level of discomfort and anxiety. An alternative, Activity B, that has been used successfully gets people using the word processor immediately in a non-threatening activity.

A. Practicing Keyboarding Skills with a Typing Tutor

1. Choose an easy-to-use typing program and load it into all machines.
2. As people come in, help them get started with the program.
3. Since most classes have two people per computer, it will be important for you to monitor the class to make sure everyone has a turn. In the past, those not working the machine have been content to watch, but you may wish to have them work on another non-computer task such as evaluating the tutor program.
4. Debrief by encouraging discussion about the software, the participants' keyboarding skills, and their experience using the program and working on a keyboard.

B. Oranges

1. Buy one orange per participant before class.
2. As participants come into the class, explain the minimum they need to know to enter information into the word processing program, i.e., the wrap-around function, moving the cursor and correcting errors. Encourage them, however, to ignore errors during this exercise.
3. Pass out the oranges and have one partner describe his/her orange while the other enters the information. Switch partners.
4. Explain how to get hard copy with the program and have participants print their descriptions.
5. Put all the oranges in a bowl or box. Have participants exchange descriptions and try to find the orange that matches the description.
6. Debrief the activity.

2. Agenda Review and Review of Previous Sessions

See Leader's Guide.

3. Planning for Panel Presentation

Check with the group to see if the invitations were extended and accepted. Make new plans if necessary.

4. Presentation on Word Processing

The following activity is the most successful method we have used to introduce word processing. Most classes found that using the sample files developed by the instructor was more helpful than using a demonstration or tutorial program. You may wish to put a keyboard on newsprint to illustrate your demonstration.

- A. List Main Commands and Functions for Word Processing** — Make a list of the main commands and functions for the word processing program you are using. Some programs, like Appleworks, allow the user to print out the help menu.

1. In particular, review the following before participants begin working on the computer.
 - a. Information regarding booting up the program.
 - b. What the cursor is and how one controls it.
 - c. Techniques of correcting errors.
 - d. Explanation of the wrap-around function and when to use the return key.
- B. **Make Sample Exercises** — Make up some sample exercises for students to use. See the example included.
- C. **Explain Program Being Used** — Provide participants with an overview of the program you are using, its strengths and weaknesses. Walk participants through loading a file using the disk you have developed in B.
- D. **Explain Correction of Errors** — Using the samples, explain how errors are corrected with the program, including overstrike and insert cursors, search and replace functions, move and copy functions, etc.
- E. **Practice Using Functions** — Let participants practice using these functions to correct errors on the sample files.
- F. **Getting a Hard Copy** — Explain how to get hard copy using the program and have participants print out their corrected text.
- G. **Using New Skills Learned** — Have participants use their new skills to write a letter.
- H. **Debrief** — Debrief and ask for additional questions.

5. Overview of the Writing Process

The purpose of this overview is to briefly introduce the writing process and, particularly, free writing as a method for doing pre-writing. Refer to the materials in the participant's manual in developing your presentation.

- A. **Discussion on Writing** — Introduce the discussion of writing by commenting that knowing how to use a word processor is not enough. A person must have something to write about and be able to communicate that idea clearly.
- B. **Why Writing Can Be Difficult** — Writing can be difficult for several reasons. Many of us have trouble getting started. When we do get down to writing, we often have a great deal of anxiety about how judgmental the reader will be when he/she reads what we have written.
- C. **The "Writing as a Process" Approach** — The "writing as a process" approach to writing provides a helpful way of viewing writing, getting started, and editing a final piece.
- D. **Three Stages of the Writing Process** — The "writing as a process" approach to writing breaks the writing process down into three stages: pre-writing, drafting, and editing.
- E. **Brainstorm** — Pre-writing is the stage of idea generation. Have the group brainstorm some of the techniques they use to generate ideas or think through issues.

6. Using a Word Processor/Free Writing

This activity is designed to give participants a chance to work with free writing as a technique for the discovery stage of writing. It will be most successful if participants have a topic to write about in which they are very interested.

- A. Doing the Free Writing Activity** — If the group has worked through the agenda quickly, this activity can be done in class. Otherwise, have participants do the free writing at home.
- B. Brainstorming** — Brainstorm ideas for the free writing exercise, or have several topics prepared and written up on newsprint. Some topics for consideration are: How have computers changed your life? What will you do with your new computer skills? How will the advent of computers affect your community? Or they can work on a writing task of their choice, such as a letter to the editor, an article for the local newspaper, or a letter to an old friend.
- C. Review the Rules for Free Writing.**
1. You must keep writing — if you can't think of anything, keep writing the last word you wrote.
 2. Write what comes to mind and don't be concerned about grammar, spelling, punctuation, etc.
 3. Write for a specified time. We suggest 10 minutes for this exercise.
- D. Divide the Class Into Two Groups** — One group can do free writing on the computer while the second group uses the user's guide to answer a question. Make a list of questions and have them work in pairs to find the answer. Sample questions include: What is the helpline number? How do I find out what an error message means? How do I change the type of printer the program is geared to using? The questions must be tailored to the word processor you are using. If you have only one user's guide, you can encourage those waiting to use the manual to read the section on the writing process. Or you may wish to let those who are unfamiliar with the keyboard to use a pencil for their pre-writing.
- E. Divide the Class Into Smaller Groups** — After each group has done some writing, break them into groups of 3 or 4 and instruct them to share what they wrote. It is not necessary to read what they wrote, only to summarize.
- F. Debrief** — Bring the group back together and debrief the free writing experience. Debrief their experience with the user's guide.

7. Evaluation

See Leader's Guide.



Session VI

Writing with a Word Processor

This session is designed to provide additional experience on the word processor and with the writing process. Ideally, participants should use the essay from the previous session or a draft written at home to really experience the computer as a tool for rewriting. Once the rewriting is done and gone over in editing groups, participants can then use the computer as a tool for final editing, including formatting the hard copy and finding and replacing misspelled words. This exercise is most useful if the final product is useful to them, so encourage them to think of a writing project they have put off, such as: describing an experience, corresponding with a friend, relative, congressperson, or business contact, or relating an incident for their family history. This session also includes some brainstorming/ discussion on criteria for evaluating software. This discussion will help participants prepare for the panel discussion.

Overview

Objectives

- To work on designing and editing written work on the word processor.
- To practice using the word processor.
- To introduce participants to the idea of software evaluation.

Competencies

Computer Skills:

1. Move blocks of text.
2. Use the search/replace function.
3. Know how to format hard copy.
4. Identify several ways to use word processors and the writing process.
5. List 5 criteria for evaluating software.

READIness Skill:

1. Practice using editing skills, including an editing group, sentence construction, paragraphing and word usage.

Pre-Class Tasks

1. Put activity instructions and agenda on newsprint.
2. Have additional software available for those who finish early.

SAMPLE AGENDA

Time	Activity	Materials	Comments
Pre-class	Terminology Review Other Programs	Program software	
15	Warm-up Brainstorm how word processors can help writers Brainstorm how they can hinder writers		or use the 'Tell a story' activity
5	Review Previous Sessions Agenda Review	Agenda on newsprint	
45	Writing and Rewriting (5) Presentation on writing and rewriting (5) Brainstorm ways of organizing their writing	(May want to have several examples on newsprint)	
	(15) Individuals work to organize their writing (5) Explain editing groups and brainstorm guidelines	Newsprint	
	(15) Discuss outlines in editing groups		
10	Break		
55	Drafting/Software Review (5) Explain tasks (40) Groups work on drafting or brainstorm guidelines for software (15) Debrief editing/drafting (15) Debrief software evaluation		
5	Learning List	Newsprint	
5	Brainstorm questions for panel	Newsprint	
5	Evaluation	Newsprint	

Activities Description

1. Warm-Up: Brainstorming Session

- A. **Brainstorm Ways Word Processors Can Help** — Have the class brainstorm all the ways word processors can help writers with their craft.
- B. **Brainstorm Ways Word Processors Can Hinder** — Brainstorming again, list all the ways word processors can hinder writers in their craft.
- C. **Discuss the List.**

2. Agenda Review and Review of Previous Sessions

See Leader's Guide.

3. Writing and Rewriting

The purpose of this activity is to give each person a chance to work on organizing the main ideas out of the free writing they did earlier.

- A. **Review the Writing as a Process Approach to Writing.**
- B. **Writing/Rewriting** — Discuss the writing/rewriting stage where the pre-writing data is developed into a draft. Have the group brainstorm ways they organize their writing. Discuss criteria for a well organized and argued piece of writing including: an introduction, a conclusion, a clearly stated main idea and support for the idea. Using one of the topics from the free writing activity, have an example of an outline or diagram on newsprint.
- C. **Organize Ideas for Pre-writing** — Have participants work on organizing the in ideas from their pre-writing activity using whatever technique is easiest for them (blocks, outlines, diagrams, etc.).
- D. **Discuss the Role of Editing Groups** — Point out that the role of editing groups is to help the writer understand how readers will perceive his/her writing. Have the class develop a list of guidelines for editing groups. These guidelines should include the following: no judgmental comments, and the emphasis should be on positive comments. There is a list of editing guidelines in the manual which the groups can follow in their discussions.
- E. **Discuss Outlines or Diagrams** — Have participants discuss their outlines or diagrams in groups of three. Since the goal is to have everyone experience the process, it is not important if they have an unfinished outline.

4. Drafting/Software Evaluation

In order to give participants an opportunity to work with the word processor, it will be necessary to divide the class into two groups. While one group works on the machine to develop a draft, the second group can make up a list of software evaluation criteria.

- A. Explain the Role of Software Evaluation** — Provide each group with newsprint as they begin working on this task. Have them make a list of criteria for evaluating software or what to look for when you are buying software. They can then use that criteria to evaluate the software used in the class.
- B. Develop Draft** — The first group will take about 20 minutes to develop a draft based on the outline they did earlier. They will have time for only 1/2 to 2 pages. The goal is to have them work with the process rather than complete a draft.
- C. Have the Groups Switch Tasks**
- D. Debrief the Editing/Drafting Activity**
- E. Debrief the Software Evaluation Activity**

5. Learning List

Ask participants how they will use what they have learned in this session.

6. Planning for the Panel Discussion

Have participants brainstorm a list of questions they want to ask members of the panel.

7. Evaluation

Editing Groups

Editing is perhaps one of the hardest writing skills for people to learn. In the last several years, numerous projects have worked with a new approach to teaching editing and revision skills. This approach revolves around the use of small groups with members of the small group acting as co-editors. Some of the exercises and discussion sessions described in this manual are based on this approach.

Since many people are reluctant to share their writing with others, it is important to begin with some activities that help small group members get to know each other and build an atmosphere of trust. Once the group members are comfortable with each other, they can begin to share their writing. Before doing so, the group should set some guidelines for the editing groups.

The purpose of the editing group is to give the person feedback on the effectiveness of his/her writing. Rather than teaching people about topic sentences, theses and themes, we suggest that people write and then share their writing with others. The editing group can use the editing checklist to guide in giving effective and appropriate feedback to each other. This approach focuses on actual communication rather than on learning the rules that facilitate the communications. We have found that learning by doing, rather than by memorizing the rules, is far more effective for most adult learners.

The final piece may have some elements in it that still confuse one or two members of the group; but for it to make sense to others, it must be fairly well organized. Participation in the small group will sharpen everyone's editing skills.

Suggested Editing Group Guidelines:

- 1. No judgmental remarks.
- 2. No sarcasm.
- 3. Respond to what is written, not the person who wrote it.
- 4. Comments should reflect the editor's ownership.

Example: I don't understand this; not, This is no good.

Organizing Your Ideas for Writing

Thesis Statement: Computers will mean both positive and negative changes for my community.

Outline

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Introduction 2. Body 3. Body 4. Conclusion | <ol style="list-style-type: none"> 1. Computers Mean Change <ol style="list-style-type: none"> A. Types of changes B. Why important for my community? 2. Positive Changes For My Community <ol style="list-style-type: none"> A. B. C. 3. Negative Changes for My Community <ol style="list-style-type: none"> A. B. C. 4. People Can Influence How Computers Affect Them |
|--|--|

Block Diagrams

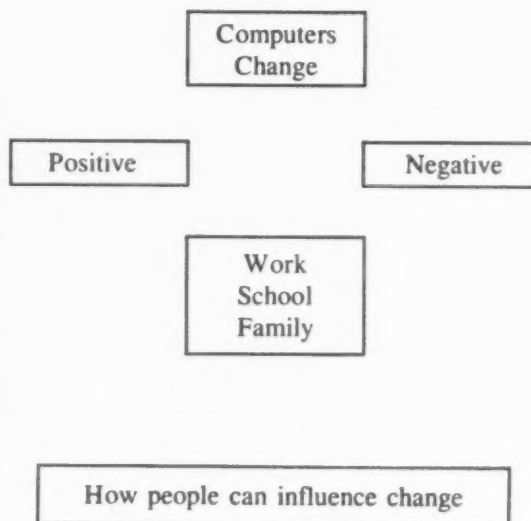
Introduction	
Types	Why important

Positive Changes		
A Work	B School	C Family

Negative Changes		
A Work	B School	C Family

Conclusion: People Can Influence Change		
A	B	C

Diagram Example



Word Processing and Writing Skills

Alternative Writing Activity: Tell a Story

"Tell a story" can be a fun activity to get people using the machines and to get the creative juices flowing.

1. Explain the activity.
2. At the computer, have several volunteers begin stories by describing a place. They should write 2 to 3 lines.
3. Have other volunteers continue writing the story by describing a time of day.
4. Continue until everyone has had an opportunity to contribute to a story. Additional topics include:
 - Introduce mood or color.
 - Describe a character.
 - Describe a second character within the first as in conflict.
 - Describe a conflict.
 - Write some dialogue.
 - Write a story ending.

Session VII

Computer Applications

Many people purchase computers out of fascination for new technology. Computers, however, like any other good tool, are useless without an application. The purpose of this session is to give participants

a chance to investigate different computer applications and, especially, to think about ways this tool might be applied to home, work, and school tasks.

This session also builds on the problem-solving approach introduced earlier. Encourage participants to think about the problems the various pieces of software might relate to. It is important to focus attention on this aspect of software review because participants might otherwise spend the time playing a computer game without really thinking about the use of the technology.

Overview

Objectives

- To examine some different software packages that exist.
- To provide an opportunity for participants to discuss computer applications to current issues.

Competencies

READIness Skills:

1. Understand how to access reasons by interviewing others.
2. Use problem-solving skills in asking and developing questions and doing resumes.
3. Identify an example of decision-making skills applied to computer use.

Computer Skills:

1. Use an established criteria to evaluate a software package.
2. List 3 different situations where computer power can be applied.

Pre-Class Activities

1. Put agenda and any activity instruction on newsprint.
2. Contact speakers.
3. Plan VisiCalc presentation and develop any necessary aids.

Sample Agenda

Time	Activity	Materials
Pre-class	Terminology Review Other software	Software
5	Welcome	
5	Introduce Panel	
60	Panel Discussion	
20	Break - Refreshments	Refreshments
40	Informal discussion and demonstration of hardware and software	Hardware Software
10	Learning list	Newsprint
10	Evaluation	Newsprint

Activities Description

1. Warm-Up: Brainstorm Questions

Before the panel members arrive, have the class brainstorm 3 or 4 questions they would like to ask each person. Brainstorming questions ahead of time helps people focus in on the issues and be prepared for a lively discussion with panel members.

2. Panel Discussion

- A. Welcome** — Welcome panel to the class and review the goals for this session.
- B. Introductions** — Have inviters introduce invitees.
- C. Panel Discussions and Demonstrations** — Allow each panelist to describe and demonstrate their computer use and answer questions.
- D. Demonstrate Spreadsheet** — You may wish to demonstrate a spreadsheet as part of the panel discussion. (See Unit II instructor's materials on spreadsheets.)
- E. Finish Projects and Sample Software/Hardware** — After the formal presentations, use the remainder of the class period for participants to work informally with sample software/hardware and finish projects.

3. Learning List

See Leader's Guide.

4. Evaluation

See Leader's Guide.

Session VIII

Putting It All Together

This session has been designed so the peer teachers and READI staff can get feedback from participants. In addition, participants need a chance to think about and do some planning for how they will interact with computers in the future. This is a time for resource people to have suggestions ready for other educational and work-related opportunities. We want people to leave the session with some confidence in their skills and looking forward to how they will make use of their skills.

Overview

Objectives

- To provide closure to the class.
- To provide an opportunity for participants to discuss how they will use the information and skills they have learned.
- To evaluate the class.
- To explain the next sequence.

Competencies

Computer Skill:

1. Identify at least one future application or use.

READIness Skills:

1. Use decision-making skills to identify a potential goal for using the computer skills.
2. Use planning skills to decide on steps for reaching a goal.
3. Use evaluation skills in assessing this class.

Pre-Class Tasks

1. Put agenda and activities description on newsprint.
2. Develop and copy course evaluation form.

Sample Agenda

Time	Activities	Materials	Comments
Pre-class	Hands-on-terminology other software	Software	Have word processing software available for those who want to continue with word processing.
5	Welcome		
20	Warm-up		
(5)	Explain activity and question "What have I learned and how will I use it?"		
(3)	Participants think about question		
(12)	Participants share responses Post answers	Newsprint	
5	Review of Previous Sessions		
5	Agenda Review	Newsprint	
40	Practice time or introduction to spreadsheet or database	Software	
10	Break		
40	Futuring		
(2)	Explain activity		
(10)	Free write on "How I will be using my computer skills in 1 year."		
(10)	Share writing in 3's		
(10)	Small groups report back		
(8)	Class brainstorm resources	Newsprint	Discuss possibility of starting a user's group.
15	Class evaluation	Evaluation form	
10	Awards and recognition Sign up for Unit II		

Activities Description

1. Warm-Up: Sharing of One Thing Learned from the Class and How They Will Use It

The purpose of this activity is to help participants recognize that there are many ways they can use their new skills. In addition, describing a goal is an important step in actually reaching that goal, so that sharing a potential use of new skills can actually help people put those skills to use.

2. Agenda Review and Review of Previous Sessions

3. Practice Time of Introduction to Data Base or Spreadsheet

If participants have projects that require more time, the first half of the class can be used to allow them time to complete those projects. Other READI classes have used the first hour of this class to provide a brief overview of database and/or spreadsheets as an introduction to Unit II. The introductions are most successful if they provide participants with an opportunity to use an already existing template in a problem-solving application. Budgets and mailing lists are useful here.

4. Futuring

The purpose of this activity is to help participants plan how they will use what they have learned and to assist them in planning to continue their education.

- A. **Free Writing on Future Uses of Skills Learned** — Have participants use the free writing format to write about how they will be using the skills and concepts learned in this class one year from now.
- B. **Have Participants Pair-up for Discussion** — Have participants share what they have written in pairs.
- C. **Report Back** — Bring the group back together and have the pairs report back. Make a list on newsprint of the activities mentioned.
- D. **Brainstorming** — As a class, brainstorm resources for reaching the goals, including other classes, user's groups, individuals, books and magazines. If there is no local user's group, discuss starting one.

5. Class Evaluation

See Leader's Guide.

6. Awards and Recognitions

Pass out certificates. Some READI classes developed special awards for class members, such as flying fingers, hacker of the year award.

7. Sign-up for Unit II

Unit II

Instructor's Guide

Introduction

The purpose of this curriculum is to help participants see how the computer can be a tool in problem-solving. It therefore challenges the learner to use a real life application. In addition, it emphasizes the role

the user plays in computer applications. The goal is to reach past the focus on hardware and software to the application, so that the computer becomes as "invisible" in the problem-solving process as a hammer is in building a house.

While Unit I was a fairly structured experience focused on specific class sessions, Unit II is designed in a looser format with the focus on topics. As a result, this design is both easier and harder to use. It is easier because the class focuses a great deal on group projects, and it is harder because it requires more monitoring on your part. If the class is able to focus on specific problems in which they are interested and for which the computer is a helpful tool, it can be a fascinating and challenging learning experience. If this does not happen, the class runs a risk of degenerating into "Show and Tell" or "Look and See" sessions, the meaning of which does not translate easily beyond the confines of the classroom.

The participant's manual is organized by topics rather than sessions, so you have great latitude in designing your class sessions. The following pages provide sample micro designs, Unit II activity descriptions, and class materials based on the participant's manual. Use them as a guide, picking and choosing what will work best for your group.

Teaching About Data Base Managers and Spreadsheets

In the November 1985 issue of *COMPUTER TEACHER*, author Beverly Hunter describes three stages in learning about data bases: using existing data bases, building data files with existing templates, and designing data base templates. A similar pattern is also appropriate for learning about spreadsheets. The session micro designs that follow include activities in all three areas for both spreadsheet and DBMS.

	Use	Build	Design
Spreadsheet	Family Budget	Amortization Schedule	Group Project
Data base	Class Roster	Tourism Guide	Group Project

The "do it, then debrief it" approach is critical to discovery learning. Discovery learning helps people learn skills and knowledge rather than just memorizing. They are also more likely to retain that learning if it is learned in an active mode.

Using a Data Base or Spreadsheet

These activities help participants explore the file to see what information it contains and how it is organized. Participants can use these files to answer questions about the information using the program's functions. For example, using the class roster data base, participants can discover how many of them live in a particular area. Using the spreadsheet, they can identify how much was spent in each category. At this stage, participants should be able to identify the types of information needed to solve a problem or answer a question. In the first case, the addresses or zip codes of class members are needed. In the second example, the values of the expenses are needed. As participants work through these examples, they will have experience in analyzing and debugging the information, particularly in printing out data base reports. Finally, participants can update the files by changing addresses or expenditures.

Building a Data Base or Spreadsheet File

Creating a file with an existing template teaches participants to:

- Analyze the problem to be researched. (Will I save money if I change my mortgage? or How can a family of four visit this area on \$50 a day?)
- Plan research
- Locate sources of data
- Gather information
- Categorize information
- Check accuracy of data
- Organize data
- Enter data into the computer

Mentioning each of these skills will be important to the learning process. But, again, doing and then discussing is the best approach.

Designing Files — By the time participants get to this stage, they will be familiar with the program and will be able to concentrate on planning the best way to organize their information. Designing their own file in small groups will provide practice in the following:

- Project planning,
- Small group decision-making,
- Problem analysis,
- Interviewing and research skills,
- File design including content, format, screen layout and report format,
- Debugging, editing and revising.

By the end of the class, participants should understand and use the programs you have selected. They should also be able to apply the power of the computer to problem-solving and decision-making by using skills in organizing and researching data, and in planning and analysis.



Session I

The Computer as a Tool

Overview

The primary purpose of this session is to introduce the concept that the computer is a tool for problem-solving and decision-making. Since this goal presupposes an understanding of and skills using both processes, a review of those processes is suggested. In addition, participant introductions and a review of participant expectations are important goals for this session.

Ideally, participants will organize their work in the following sessions based on the group project they identify in this session. In some past READI classes, participants have been reluctant to commit themselves to both a group and a class-long project. Facilitating this part of the session, then, will take careful monitoring because it will be unproductive to force participants into group projects to which they have no commitment. At the same time, some effort must be made to arrive at a project which can expand the participant's learning.

Objectives

- To introduce participants to each other.
- To examine the relationship between problem-solving and computer applications.
- To apply the computer as a tool for decision-making in using a family budget.
- To have participants begin developing a group project.

Competencies

Computer Skills:

1. Use a family budget template.
2. Describe how a computer can be a tool for decision-making.

READIness Skills:

1. Apply the problem-solving process to developing a family budget.
2. Apply the decision-making process to using a family budget.
3. Use a family budget.

Pre-Class Tasks

1. Cut out pictures of people using computers.
2. Put agenda, decision-making process and family budget example on newsprint.
3. Locate and test software.
4. Design data base template for class roster.

Sample Agenda

Time	Activity	Materials
5	Welcome	
25	Warm up: Have participants select pictures that illustrate their goals and their anxieties about using computers.	Pictures
10	Course overview	Newsprint
10	Problem-solving and the computer presentation.	
50	Apply problem-solving to developing a family budget. - go over process - let them do some of the exercises in pairs or small groups	Worksheet
10	Review and discuss.	
10	Show examples of budget on spreadsheet and software record keeping on data base management system.	Template
10	Discuss how to choose their group project.	
10	Wishes and plusses, or evaluation.	Newsprint

Activities Description

1. Pre-Class Activity: Class Roster

This activity will give participants a hands-on activity with which to start their class experience. It will also give early arrivals something to do. You may wish to have other templates or programs bootied up if you expect many early arrivals.

- A. Locate an easy-to-use data base program.
- B. Design a class roster template. You may wish to include a category on values for use later in the session.
- C. Explain how to use the template as people enter the room.
- D. Print the class roster.

2. Warm-up: Futuring with Pictures

This activity is an ice breaker, but it also provides participants with an opportunity to think about their goals for using their computer skills.

- A. Cut out pictures of people using computers. Your selection should include positive images of people working with computers as well as those that show frustration or anger. The selection should also include pictures from a wide variety of job circumstances as well as images of both men and women and representation of all races and ages.
- B. Ask participants to look through the pictures and choose one that represents their goal for working with computers, and one that represents how they feel about working with computers now.

- C. After they have chosen their pictures, have them share them with the group.
- D. List goals on newsprint and save for the last session.

3. Overview of the Class

It is important to discuss the course with your participants so they will know what to expect. It will help them understand how the sessions fit together and build on each other.

- A. Using the goals they listed in the warm-up activity, ask the class to list their expectations for the class. If the group is small enough, have each person contribute one expectation and then, after everyone has had their say, ask for additional contributions.
- B. Using the list of expectations, review the overall objectives of the course. Emphasize the course goal of using the computer as a tool for decision-making and problem-solving. Review the content of each session briefly. Discuss how group projects are critical to getting the most from the class.
- C. Comment on any expectation that will not be met by the class and suggest alternatives wherever possible.
- D. Hand out manuals and provide an overview. Mention that sections are not organized by session, but rather, by topics. Point out the log sheet and explain that it is to be used for notes, questions, and as a place to record feelings and reactions.
- E. Review the objectives for this session.

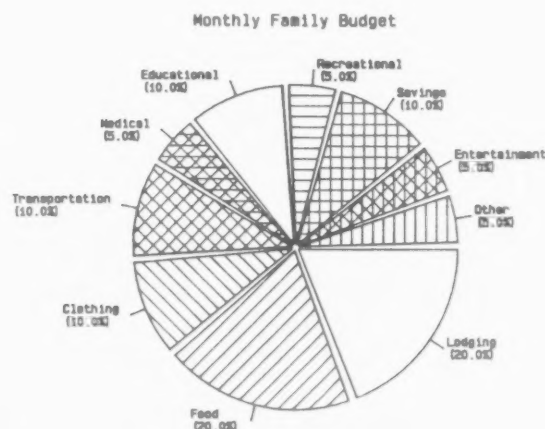
4. Computers as Tools for Decision-Making and Problem-Solving

This introduction to decision-making and problem-solving sets the tone for the entire unit. The ideas and skills introduced here will be used again and again during the class.

- A. Develop a spreadsheet and/or data base templates for the budget and make charts of sample budgets.
- B. Have participants think of a recent decision they made and brainstorm methods or strategies they use in their decision-making process.
- C. Discuss how problem-solving is related to decision-making and why computers can be an important tool in these activities. Use a chart or handout, such as the following, for your discussion.
 - 1. Identify decision to be made or problem to be solved.
 - 2. Clarify values.
 - 3. Set goals.
 - 4. Clarify problems to be dealt with.
 - 5. Collect information.
 - 6. Identify alternatives or strategies.
 - 7. Analyze alternatives.
 - 8. Evaluate possible strategies.
 - 9. Decide on strategy and implement.
 - 10. Evaluate success of strategy, as well as the method you used to choose it.
 - 11. Return to step 3 or 4.

D. Illustrate this model by working through the problem of doing a better job of working with family finances. This is a useful example because finances are an important aspect of people's lives. Because of poor money management, many people are in debt, many others do not have an adequate source of income for retirement or for emergencies, and often people are unprepared for new financial needs. In addition, poor family financial management results in many divorces and social problems.

1. **Problems:** How can we use our money more effectively?
2. **Values:** What is most important to us in terms of how we spend our money? Education? Recreation? Comfortable car and home?
3. **Goals:** What goals do we want to set — saving for a college education or a vacation or investing in our future? Using a pie chart, make up a budget encompassing some set goals.



4. **Clarify Problem:** If we are to meet our goal, we need to monitor and control our spending more effectively.
5. **Collect Information** — There are two parts to this step. We need to collect information on how much a college education will cost, for example. Secondly, we need to learn more about how we currently handle our money, including reviewing our records, the checkbook register, and pay receipts. Make a pie chart of current expenditures.
6. **Identify Alternatives** — Based on the information we have gathered, we can discuss alternatives. If saving for a college education is the example, we can look at the costs of attending different educational institutions. We must also look at ways of changing spending habits to make more money available for reaching our goals. Have the class suggest some ways of changing spending habits to facilitate reaching the goal.
7. **Analyze Alternatives** — Using the template, look through several of the suggestions. What if we reduced our clothing budget to 5%? What if we spent less on recreation?

8. **Evaluate Strategies** — Based on the analysis developed above, which strategies for reaching our financial goals will work best?
9. **Decide on a Strategy** — Discuss with the class how the strategy could be implemented.
10. **Evaluate** — Discuss how keeping track of expenditures and comparing them to the goals can be done with the template.
11. Discuss the fact that working with a budget is an ongoing process.
- E. Provide some time for participants to develop pie graphs of their goal budgets and current budgets and to use the template to evaluate various strategies for reaching financial goals.
- F. Demonstrate a data base application for family budgeting, such as an inventory of family position or a family budget.
- G. Debrief by discussing how the computer facilitates problem-solving and decision-making.

5. Group Projects

Provide some time for the class to make tentative commitments to group projects.

- A. Explain the reason for group projects. Each person should work with at least one other on a project that has a data base, spreadsheet, and word processing applications.

Example:

Application	Family Budget	Community Center
Word Processing	Developing Goals	Flyer, Report
Spreadsheet	Family Budget	Budget
Data Base	Family Budget	Mailing List
Programming	Record Keeping	Recipe Multiplier
	Checkbook Program	

While the class will not likely be able to apply electronic communications, some potential applications can be listed for each project.

- B. Have class brainstorm possible projects and discuss how the various applications could be used.
- C. Break the class into groups based on their interest in a possible project. Have them write up the project with:
 - A description of the problem-solving or decision-making situation.
 - A spreadsheet application.
 - A word processing application.
 - A data base application.
 - Possibly a programming application.

If they are familiar with the word processing package you will be using, they can use it to write up their descriptions.

- D. Small groups report back and have class discussions of projects.

6. Evaluation



Session II

Word Processing Applications

Overview

In this session, participants will make final decisions about group projects. They will also have an opportunity to reacquaint themselves with word processing. If you have a mail merger function with your word processing package, you may wish to introduce it during this session. Similarly, if you have access to the PRINT SHOP or a program like it, this would be a good session to use it in.

Begin this session with an overview of the writing process and the word processing program, and then allow it to become a work session. Participants can develop final products using the programs you have available.

Objectives

- To introduce word processing.
- To have small groups work on developing a problem statement.

Competencies

Computer Skill:

1. Use a word processing program to develop a useful final product.

READIness Skill:

1. Apply writing skills to a word processing application.

Pre-Class Activities

1. Put agenda and word processor commands on newsprint.
2. Test software.

Sample Agenda

Time	Activity	Materials
5	Agenda Review and Review of Previous Session	Newsprint
30	Warm-up: Writing to an Audience	Commands on Newsprint
20	Review Word Processing Program	Newsprint
25	Demonstration: Word Processing Applications	
40	Work Session	
10	Debrief	
55	Evaluation	

Activities Description

1. Agenda Review and Review of Previous Session

2. Warm-Up: Writing to an Audience

The purpose of this activity is to prepare people for writing targeted to an audience, such as flyers, reports, and news releases.

- A. Divide the group by putting three computer groups (pairs of individuals, depending on how many people per machine you have) together.
- B. Have groups choose a topic, such as starting a small business, a community education program, or a job search. Each pair or individual would choose a potential audience and explain the project directly to that audience. For example:

Topic	Audience I	Audience II	Audience III
Small Business	Banker	Targeted Customer	General Customer
Community Ed.	Teachers	Adult Students	Youth Participants
Job Search	Friends	References	Personnel Director
Family Budget	Children	Banker	Spouse

- C. Each pair or individual would write a short piece to convince the audience they have chosen the value of the project. Or, you may wish to use the Tell a Story activity described in Unit I. This activity acts as an ice breaker and gets everyone using the word processor.
 1. Put instructions for activity on newsprint.
 2. List word processing commands on newsprint and review how to correct errors and get hard copy.
 3. Divide group according to the activity you choose.
 4. Have groups report back.

3. Review Word Processing Program

Review the word processing program you are using, including commands and how to get hard copy. You may wish to have the group do this in a discussion format. Also review the writing process (see Unit I).

- A. List commands on newsprint.
- B. Lead discussion in using the word processor.
- C. Put up chart of the writing process and discuss.
- D. Have small groups share how they will use the word processor in their group project.

4. Demonstration: Word Processing Applications

Use this time to demonstrate more advanced word processing techniques such as mail merge, bold print, or different size types. (If your class is new to word processing and did not take Unit I, see Unit I for suggestions on how to introduce word processing.) If you have access to a program like the PRINT SHOP, demonstrate how it can be used to develop flyers or cards. Have several examples of news releases, flyers, reports, and/or letters available, and brainstorm about what makes a good press release, an effective flyer, and a to-the-point letter.

5. Work Session

Have participants work on the word processing applications for their group project. They may also want to use the software to prepare individual projects.

6. Debrief

Have participants share their projects and discuss other applications and uses.

7. Evaluation

See Leader's Guide.

Session III

Spreadsheets

Overview

This session will introduce students to the electronic spreadsheet. Many students will be too anxious to learn this application. Effective use of the spreadsheet, however, requires some skills in using functions and in estimating answers. It will be important to review these skills as people begin using the spreadsheet.

Objectives

- To develop a spreadsheet template.
- To use a spreadsheet template to solve a problem.

Competencies

Computer Skills:

1. Identify at least 5 potential applications for a spreadsheet.
2. Be able to enter data into a spreadsheet and print hard copy.
3. Understand the difference between labels, values, and value references.

READIness Skills:

1. Apply estimating skills to using a spreadsheet.
2. Understand how spreadsheets use functions and formulas.

Sample Agenda

Time	Activity	Materials
15	Warm-up: Consumer Skit	Template Skit Script
5	Agenda Review and Review of Previous Sessions	Newsprint
25	Using a Spreadsheet	Commands on Newsprint Template
80	What Is a Spreadsheet?	
(5)	Develop 'What if' scenario	
(15)	Work with template	
(15)	Groups report back	
(10)	Sample spreadsheets	Newsprint
(15)	Presentation on spreadsheets	
(10)	Explain types of entries	
(10)	Overview of comments	
10	Learning List	Newsprint
5	Evaluation	Newsprint

Activities Description

1. Warm-Up: Consumer Skit

This warm-up worked very well at one READI Training Institute. It provided a real life application for using spreadsheets in family decision-making.

- A. Develop an amortization template.
- B. Choose two participants, or you and your partner can act out the skit.
- C. The skit revolves around a teenager finding what looks to be a bargain for an item with no down payment and low monthly payments. One of the parents uses the amortization template to show how much it really costs.
- D. Debrief.

2. Agenda Review and Review of Previous Sessions

3. Using a Spreadsheet

The purpose of this activity is to give participants an opportunity to use the spreadsheet. This will give them the hands-on experience they need to understand what a spreadsheet is.

- A. Have participants think of an item they wish to buy.
- B. Before sending participants to the machines, provide information on:
 - Booting procedures.
 - Cursor movement.
 - Inserting and deleting text.
 - Editing functions.
- C. Have participants boot up the amortization template on each machine and use it to calculate interest costs on the item they are thinking of purchasing.
- D. Debrief. What have we learned about spreadsheets and loans?

4. What is a Spreadsheet?

Now that participants have some hands-on experience using the spreadsheet, it is possible to demonstrate its use in decision-making. Introduce the "what if" experience. After they have worked with the templates, provide some additional background information on how spreadsheets work.

- A. Have participants develop a "what if" scenario related to loans or family budgets by identifying a potential decision to be made. For example, how much would I save if my mortgage was 10 years instead of 15 years? Or, how much money would we have to invest if we cut expenses in recreation and clothing?
- B. Have them work with the templates to collect and analyze information to help with the decision.
- C. Have participants report back to the group on the "what if" scenario they worked with, and how they would use that information to make a decision.
- D. Use a simple example of a spreadsheet on newsprint or a blackboard to introduce the concept of spreadsheets. You could, for example, choose to use the amortization schedule.

- E. Explain what a spreadsheet is and how it is used. Point out that the spreadsheet is an effective electronic ledger, but it has also become an important decision-making tool. "What if" scenarios can be easily setup with a spreadsheet, and they can help predict outcomes of various strategies. It is also true, however, that *Fortune* magazine reports large computers are losing millions of dollars because many executives' spreadsheets were set up incorrectly and, thus, resulted in poor decisions being made. Discuss the importance of estimating and review strategies for estimating answers. Have the group practice with several situations related to the template you are using. Depending on your example, have participants brainstorm potential "what if" questions and discuss how the answers might lead to more effective decision-making.
- F. Explain the different types of entries including labels, values, functions, and formulas by pointing out how they are used in the examples.
- G. On newsprint, list commands for replicating formulas, moving text, and formatting text. Review these with the class and, if there is time, allow them to work with commands using either the family budget from Session I or the amortization schedule.

5. Learning List

See Leader's Guide.

6. Evaluation

See Leader's Guide.

Session IV

Developing a Template

Overview

The purpose of this session is to provide participants with an opportunity to develop their own spreadsheet template. Since designing a template presupposes skills in understanding and using formulas, this

session will also provide some review on this topic and other math concepts related to using a spreadsheet.

Objectives

- To introduce electronic spreadsheets.
- To apply program to scenario.

Competencies

Computer Skills:

1. Develop a template.
2. Be able to replicate formulas or text.
3. Be able to print hard copy of a spreadsheet application.
4. Be able to use several formatting commands.
5. Identify at least 5 potential applications for spreadsheets.
6. List two ways that spreadsheets can aid in decision-making.

READIness Skills:

1. Be able to use formulas in a spreadsheet.
2. Understand and apply the concept of order of operations.

Pre-Class Activities

1. Put commands for formatting, replicating, copying, and printing on newsprint.
2. Have additional templates available for those who finish early.
3. Find software for function machine or develop exercises on newsprint or the blackboard.
4. Develop signs for SPREADSHEET SLIDE.

Sample Agenda

Time	Activity	Materials
15	Warm-up: Functions and Formulas	Software and Newsprint
15	Agenda Review and Review of Previous Sessions	Newsprint Signs
20	Making Charts	Newsprint
85	Work Session: Developing a Template	Newsprint
(10)	Describe process for template construction	Software Template
(20)	Design Template	Worksheet (see participant's manual)
(15)	Break	
(20)	Enter template into machine	
(20)	Critique templates	
10	Learning List	
5	Evaluation	
	Learning List	
	Evaluation	

Activities Description

1. Warm-Up: Functions and Formulas

The purpose of this activity is to review formulas so people can use them effectively in their templates.

- A. Have a public domain program like the function machine or the READI BLACK BOX program booted up on the machines as people come in. Give them some time to use it and debrief by talking about the formulas.
- B. If you don't have a program that replicates a function machine, use the blackboard or newsprint. The function machine takes numbers in and gives out different numbers. The group tries to figure out what the machine does to the first number to transform it to the second. This function can then be expressed as a formula.

Function 1

In	3	Out	6
	4		8
	5		?
	?		?
	$2X=Y$		

Function 2

In	5	Out	7
	6		9
	8		?
	?		?
	$2X-3=Y$		

2. Agenda Review and Review of Previous Session

A suggestion for reviewing the previous session is the SPREADSHEET SLIDE. This exercise is a role play review of spreadsheet functions.

- A. Using the labels, values, and value references, make up some signs with cell locations.

- B. Have participants put the spreadsheet together by standing up and finding the position they represent. Change some of the values and demonstrate how values in other cells change.
- C. Debrief by asking for questions or comments.

3. Making Charts

Developing a template presupposes an ability to organize information into charts. Several people in each READI class have had trouble with templates because they are not used to organizing information on charts. The exercise listed below can help participants learn this skill.

- A. Develop several problems for small groups to work on (see list following) and one to use as an example.
- B. Present your example by first reading the question and then asking participants how they would organize that information to solve it. Several methods may be possible, and it is important to stress that no one way is more correct than another if it solves the problem.
- C. Break the class into small groups. Give each a problem and have them develop a chart.
- D. Groups report back and debrief.

4. Work Session: Developing a Template

In this activity participants will have an opportunity to actually build their own template related to their group project. Some people will move quite slowly through this activity, but others will go more quickly. Have additional materials available for those who want to use windows, fix labels and values, etc.

- A. Have additional commands on newsprint and also have the user's guide handy.
- B. Describe process for template construction.
- C. Have participants work in their groups to design a template on paper. They can use the sheet in their manual as a guide.
- D. Once they have the template organized on paper, they can enter it into the machine.
- E. Once groups have finished, they can have others try out their template and critique it.
- F. Participants who finish their group project may want to work on other spreadsheet applications, such as:
 - Personal budget plans
 - Starting a stock portfolio
 - Checkbook record
 - Inventories
 - Bids and estimates
 - Payroll accounts
 - Accounts payable

5. Learning List

Debrief. What have they learned and how can they use that information and those skills?

6. Evaluation

See Leader's Guide.

Sample Charting Problems

Below are some problems that can be used to help participants with charting. Possible charts are included.

- Given the following list of checks and bank deposits, how much money remains in the account? Assume the account was at \$100 to begin with.

Checks:

\$ 15.15
\$120.00
24.72
3.52
20.00
5.41
18.00

Deposits:

\$150.00
10.00
2.50

- Bill, Jane and Sue have made a number of sales today.

Bill

Jane

Sue

\$158
200
16
23
22
18
12

\$118
13
2
182
72

\$ 42
55
16
62
75

How much did each sell? What was their average sale? How much was sold for the day?

- A garden store had 10 green rototillers at \$1010 each, 5 red ones at \$975 each, and 2 blue ones at \$1200 each. They have 15 red lawn mowers at \$150 each, four green ones at \$125 each, and 6 blue ones at \$140 each. They also have 6 red riding lawn mowers at \$1200 each, 5 green ones at \$1100 each, and 1 blue one at \$1500. The red machines are Troybuilt, the green ones are John Deere and the blue ones are an off brand. How many of each type of machine do they have in stock? How much is their inventory of each brand worth? How much is the total inventory worth?
- Jane's Craft Store sold:

Supplies

Commissioned

Monday

\$14.00
12.00
5.00
2.00
6.00
10.00

\$25.00
40.00
20.00

Tuesday	\$12.00	\$22.00
	4.00	30.00
	2.00	
	4.00	
	8.00	
Wednesday	\$ 2.00	\$30.00
	4.00	35.00
	8.00	21.00
	12.00	
	13.00	
Thursday	9.00	
	\$18.00	\$10.00
	30.00	15.00
	5.00	16.00
	4.00	18.00
Friday	\$14.00	\$40.00
	20.00	50.00
	18.00	62.00
	12.00	80.00
	9.00	
	11.00	
	5.00	
	4.00	
	3.00	

How much were her sales for supplies and for commissioned items each day? How much were her total sales for each day? How much were her total supplies and commissioned sales for the week?

Session V

Data Bases

Overview

In this session, participants will learn about data base. They will have an opportunity to work with a data base and to use a data base in a problem-solving situation.

Objectives

- To learn how to use a data base management system.
- To practice problem-solving with a DBMS.

Competencies

Computer Skills:

1. Be able to enter data into a data base template
2. Use basic commands in a data base
3. List five uses of data base

READIness Skills:

1. Order information in a usable fashion
2. Make charts

Pre-Class Activities

1. Put data base commands and agenda on newsprint.
2. Develop a sample data base template and a sample data base.

Sample Agenda

Time	Activity	Materials
20	Warm-up	
5	Agenda Review and Review of Previous Session	
40	Introduction to Data Base	
(5)	What is a data base?	
(5)	Generate parts of a data base.	
(5)	Introduce to data base used in class.	
(20)	Work with data base on class roster.	
(5)	Discuss.	
15	Break	

Sample Agenda (cont'd)

Time	Activity	Materials
40	Problem-solving with a Data Base	
(10)	Use data base in problem-solving scenarios	
(5)	Review guidelines for problem solving	
(35)	Work with data base to answer questions.	
(10)	Discuss the data base as a problem-solving tool.	
5	Learning List	
5	Evaluation	

Activities Description

1. Warm-up: Class Survey on Computer Use

Boot up the class roster data base from Session I. Add several additional categories or fields so the class can survey themselves about computer use. For example: Do you own a computer? Y/N, Do you plan to own a computer? Y/N, What application is most useful to you?

2. Agenda Review and Review of Previous Session

3. Introduction to Data Base

In this activity, participants will learn the basics of using a data base. They will enter information and develop hard copy.

- A. What is a data base? Have the group brainstorm answers to the questions: What is data? What are some examples of data bases? How are each of these data bases organized; that is, how are they managed? You may want to have a telephone book, address book, checkbook, etc., for examples. What are some examples of data you manage in your own life?
- B. Use the examples generated to describe the parts of a data base: file, record, and field. Discuss the kinds of data that are alphanumeric and numeric and give examples of how these data might be used. Databases can be used simply to store and manipulate data as with sorting address lists, or they can be used as problem-solving tools as with data bases that help you answer questions.
- C. Introduce participants to the data base they will be using in class including:
 - How to load a file and save files
 - Editing entries
 - Deleting and inserting data
 - Sorting and arranging information
 - Printing out lists and reports
- D. Use the class roster data base developed in Session I. Have pairs work with the class roster data base and use it to perform several functions, such as: printing an address list, making a report of who has attended class, listing those who live in a specific zip code area, etc. Participants should leave the session with a printout of class names.
- E. Discuss.

4. Problem-solving with a Data Base

Now that participants have some experience with the program, review the problem-solving process and give some examples of how data bases can aid in this process. (See Problem Solving with a DATABASE in the Participant's Manual.)

- A. Develop several existing data bases that can be used in the problem-solving scenario. For example, you may want to list local tourist attractions and have participants plan vacation activities within a specified budget, or you may have them work with a sample inventory template and suggest ways the owner could cut down on operating costs. Data bases can also be used to collect information, as in the example on user's groups.
- B. Review the guidelines for problem-solving.
- C. Have participants work with the sample data base to answer specific questions.
- D. Discuss the data base as a problem-solving tool and have the group brainstorm problem-solving situations in their own life where database management could be a helpful tool.

5. Learning List

See Leader's Guide.

6. Evaluation

See Leader's Guide.

Session VI

Developing Data Base Templates

Overview

This session is primarily a work session where participants will use what they have learned from the previous session and apply it to group projects.

Objective

- To identify and develop an application for data base management systems.

Competencies

Computer Skills:

1. Design a data base template.
2. Use a data base program as a problem-solving tool.

READIness Skills:

1. Know how to sort and arrange data.
2. Use problem-solving skills.

Pre-Class Activities

1. Put agenda and commands on newsprint.
2. Put format for developing a template on newsprint for your example as you go over the material.

Sample Agenda

Time	Activity	Materials
15	Warm-up	Newsprint
5	Agenda Review	
115	Designing a Template	Commands on newsprint
(15)	Review Commands	
(15)	Discuss guidelines for developing a template	
(15)	Break	
(20)	Small groups develop design on paper	
(30)	Small groups develop template	
(20)	Small groups demonstrate their templates	
10	Learning List	
5	Evaluation	

Activities Description

1. Warm-Up: Filling Game

In this activity participants will act out a data base sort to learn about how the computer handles this task.

- A. Have the class stand in a line.
- B. Have them sort themselves out alphabetically, beginning at one end and moving the first individual down the line until he/she is ahead of someone whose name begins with a letter occurring later in the alphabet than his/her name begins with. Return to the front of the line and repeat. Continue until the group is in alphabetical order by name (first or last, your choice).
- C. Discuss. What have we learned about how the computer sorts data?

2. Agenda Review and Review of Previous Session

3. Designing a Template

In this activity participants will construct a data base template related to their group projects.

- A. Review commands for using the data base program your class is working with, including:
 - 1. Editing an entry
 - 2. Moving from one entry to another
 - 3. Deleting and inserting data
 - 4. Copying and moving text
 - 5. Developing calculated fields
 - 6. Sorting and arranging information
 - 7. Finding a specific value
 - 8. Printing out data
- B. Discuss the guidelines for developing a data base using the format in the participant's manual as a guide. Emphasize the value of a database in problem-solving. Use a simple example of a data base on newsprint or a blackboard to introduce the concept of data base management. You will probably want to begin with setting up fields and follow with a chart of what the file might look like. With an example, such as an address list or an inventory list, work through designing a template following the outline in the manual.
- C. Work session: Participants should work in their groups to design a data base first on paper. Once the design is on paper, they can enter it into the machine.
- D. Have participants demonstrate their template to the class and allow time for class members to use each other's templates.

4. Learning List

See Leader's Guide.

5. Evaluation

See Leader's Guide.

Screens for Appleworks Data Manager

A. Designing a Template

CHANGE NAME/CATEGORY

File: Tourist

Escape: Erase entry

Category names

TYPE OF ATTRACTION

NAME

Options:

LOCATION PRICE RANGE

Type category name

DESCRIPTION

Up arrow

SEASONAL

Go to previous category

OTHER INFORMATION

Type entry or use @ commands

25K Available

B. Entering Data

REVIEW/ADD/CHANGE

File: Tourist

Escape: Main Menu

Selection: All records

Record 3 of 7

TYPE OF ATTRACTION: Lodging

NAME: Big House Bed and Breakfast

LOCATION: 4th and Ash

PRICE RANGE: \$15 single and \$25 double

DESCRIPTION: Clean and friendly

SEASONAL: Closed November to May

Type entry or use @ commands

@ - ? for Help

C. Sample Template

Below is an example of a template for developing a tourist guide to a local area.

A sample of what entries might look like follows:

File: Tourist

Page: 1

Report: Local Attraction

Restaurant

Lou's Cafe

5th and Main

Very reasonable

Family cafe

No

Restaurant

The Steak House
South Highway
Moderate to High
Good Dinners
No

Lodging

Big House Bed and Breakfast
4th and Ash
\$15 single, \$25 double
Clean and Friendly
Closed November to May

Lodging

Best Western
Main and Center
\$35 single, \$45 double
Good
No

Recreation

Big Hill Ski Resort
South Highway
\$15 day pass
Good Hills
Winter

Recreation

Fishing on the South Fork
Along South Highway
Fishing Supplies
Nice trout, some bass
May to September

Recreation

South River Museum
Main Street
Donation
Very interesting, early history
No



Session VII

Telecommunications and Integrated Programs

Overview

Since telecommunications is likely to become a major computer application, one purpose of this session is to provide participants with exposure to and experience with telecommunications. Some READI classes have used extension's electronic mail system for demonstration, holding class at the extension office for part of the evening. Other ways of demonstrating telecommunications include using an individual's access to one of the commercial electronic data bases, or using the school's account to access the Idaho employment data base through the State Division of Vocational Education.

A second purpose of the session is to demonstrate integrated applications. Many of our classes used the Appleworks program which allows data to be transferred from the spreadsheet and data base to the word processor. Participants can use this capability to develop reports on their projects.

Objectives

- To finish work on projects.
- To write a report for small group activity.
- To demonstrate specific applications.

Competencies

Computer Skills:

1. List 5 possible uses of electronic communications.
2. Understand what an integrated program is.
3. Transfer data from one application (program) to another.

READIness Skill:

1. Organize data into a report.

Pre-Class Activities

1. Put agenda on newsprint.
2. Put commands for transferring data from one program to another on newsprint.

Sample Agenda

Time	Activity	Materials
5	Agenda Review and Review of Previous Session	
60	Telecommunications Demonstration	
(30)	Demonstration	
(10)	Brainstorm everyday uses of tele-communications	
(10)	Describe how telecommunications works	
(10)	Discuss types of data bases	
15	Integrated Programs	
(5)	Describe integration and brainstorm uses	
(5)	Demonstrate how to use integration function	
(5)	Have participants integrate material	
15	Break	
50	Work Session	
5	Evaluation	

Activities Description

1. Agenda Review and Review of Previous Session

2. Telecommunications Demonstration

Ideally, participants should have an opportunity to actually see and perhaps use telecommunications to communicate with others. If this is not possible, conduct B and C.

- A. Demonstrate telecommunications by contacting another group or organization. With the READI program, we were able to use the county extension office for this meeting where they had the necessary equipment.
- B. Brainstorm examples of telecommunications in everyday life. Discuss the potential impact of increased telecommunications on individuals and communities. You may wish to do a Future Wheel on one of the common applications.
- C. Describe how telecommunications works, including how computer signals are transferred by phone line and the increasing role of satellite transmission.
- D. Discuss types of data bases and where to learn more about them.

3. Integrated Programs

In this activity participants should see the value of integration and learn how to use that function with the program(s) they have been using.

- A. Describe integration and brainstorm uses.
- B. Demonstrate how to use the integration function.
- C. Have participants integrate material from their data base or spreadsheet into their group report on the word processor.

4. Work Session

For the remainder of the session, have participants work on developing a project report. Each report should include:

- Description of project
- Why the group decided to work on it
- Word processing applications
- An example of decision-making using a spreadsheet
- An example of problem-solving or decision-making using a data base, and results of the project

Each group should also choose a reporter.

5. Evaluation

See Leader's Guide.

Session VIII

Group Reports

Overview

The main goal of this session is to encourage participants to continue with their education and/or personal development, particularly as it relates to computers. To this end, it will be important to develop and collect good referral information or perhaps invite speakers who have information on educational and employment opportunities related to computers. Your advisory committee can help with this task. A second goal for this session is to provide an opportunity for the groups to report on their project. Finally, since this is the last session, some evaluation activity is necessary.

Objectives

- To share information from the small groups.
- To discuss next steps. (County advisory groups should have referral information ready for this session.)

Competencies

Computer Skills:

1. List 5 types of local jobs that use computers.
2. List 3 educational opportunities for developing computer skills.

READIness Skill:

1. Evaluation skills.

Pre-Class Activities

1. Put agenda on newsprint.
2. Develop and print evaluation form.
3. Collect referral information.

Sample Agenda

Time	Activity	Materials
10	Agenda Review and Review of Previous Sessions	
60	Group Project Reports	
15	Break	
40	Next Steps	
(5)	Have participants think about question	
(25)	List skills and information	Newsprint

Sample Agenda (cont'd)

Time	Activity	Materials
(10)	Discuss Next Step	
20	Evaluation	
5	Certificates and Awards	

Activities Description

1. Agenda Review and Review of Previous Sessions

2. Group Project Reports

- A. Group report using criteria listed in Session VII.
- B. Discussion of reports and the value of the computer as a tool.

3. Next Steps

This activity is designed to get participants thinking about how they will use and expand their new skills.

- A. Give participants three or four minutes to think about how they would answer the questions: "What have you learned? How will you use that information or those skills?"
- B. If the class is over 15, have participants report back in small groups; otherwise, have each person share their response. List skills and information and next steps on newsprint.
- C. Discuss next steps. Brainstorm job, home, and educational applications. Pass out or present referral information and discuss.

4. Evaluation

- A. Pass out written evaluations.

5. Certificates and Awards



READ!

**Computer Literacy
For Rural Adults**



Preface

READI is a special pilot project, supported by the Idaho Cooperative Extension Service and the Fund for the Improvement of Postsecondary Education — Federal Department of Education, to develop a program to bring computer literacy to adults living in rural areas and small towns. The State READI office is responsible for both curriculum and the training of peer teachers. The state READI office is located in the Agricultural Communications Center, University of Idaho, Moscow, 83843.

READI (Rural Education/Adult Development in Idaho) is a special pilot project, supported by the Idaho Cooperative Extension Service and the Fund for the Improvement of Postsecondary Education - Federal Department of Education, to develop a program to bring computer literacy to adults living in rural areas and small towns. The state READI office is responsible for both curriculum and the training of peer teachers. The state READI office is located in the College of Agriculture, University of Idaho, Moscow, Idaho 83843-4196.

Acknowledgments

READI, a computer literacy program for rural adults, is funded in part by the FUND FOR THE IMPROVEMENT OF POSTSECONDARY EDUCATION and by the Idaho Cooperative Extension Service. The following people have contributed to the development of this project: Corky Bush, Dennis Brown, Harry Guenther, Joe Guenther, Doris Williams and Jacie Jensen. Karolyn Rogers, Mary Emery, Jacie Jensen, John Gurgel and Corky Bush worked on the curriculum, and Ann Fichtner edited this manual. Members of the project's state board are: Dave Makings, Doug Treadway, Alene Orvik, Diane Carr, Karolyn Rogers, James Gissel, Gert Walker, Marge Bauscher and Dick Winn. County Extension faculty working on the project are: Norm Fitzsimmons — Clearwater, Brian Finnigan — Blackfoot, Vicki Parker — Camas, Max Gardner — Payette, Jay Hanson — Teton, Linda Webb — Valley and Cindy Mottern — Benewah. Secretarial support was provided by Kristin Haener, Bev Bircher, Marilyn Crumley and Lois Flomer. Sheron Pheiffer from EQUALS, Lawrence Hall of Science, U.C. Berkeley, was a wonderful consultant. Special thanks to Catherine Rolzinski of the Fund Staff and to the other members of the FIPSE Cluster on Education and the Economy for their invaluable suggestions and encouragement. Staff on the project are as follows: Project Director — Mary Emery; Programmer — Jim Janoch; and support staff — Harriet Whitmore and Chana Dyer.

Introduction to Computers

A Participant's Manual for Unit I of the READI Curriculum

Mary Emery
The READI Project



University of Idaho
Cooperative Extension
Moscow, Idaho



READI Participants' Manual

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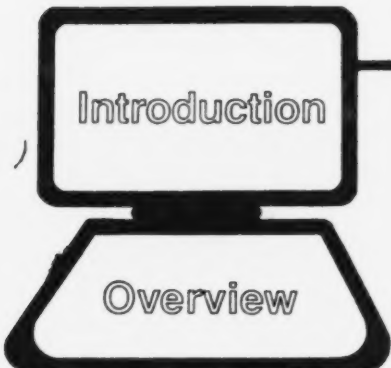
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Introduction

Overview

Welcome to the READI Project!

READI has been designed to help you learn about the world of computers. It has two components. In Unit I, you will have an opportunity to become acquainted with the computer and some of its functions. This unit is especially designed for the individual who has little or no experience with the computer and what it can do. Unit II, which will be offered in your community at a later date, is designed to provide you with an opportunity to see how the computer can be applied to the real life problems and situations that occur at work, on the farm or in the home. For more information about the project, contact your local county Extension faculty or the state office at: READI, Agricultural Science 111, University of Idaho, Moscow, Idaho 83843-4196 (208) 885-7984.

Goals and Objectives of the READI Project

The goals of the READI Project are twofold: first, to develop a curriculum that can be used effectively to train Idahoans to make the best use of computer technology; and, second, to design a system of offering the class that is cost effective and flexible enough to work in diverse communities. To reach these goals, the READI Project has a two-tier program. The project works with the Idaho Cooperative Extension Service in designing curricula and training as well as in networking resources. In addition, the project works with an advisory group to develop the program on a county level by training local resource people to teach the classes and by helping these groups identify ways technology can spur economic development. This county-level organization is responsible for overseeing the classes and evaluating the program in its area.

Unit I of the READI program has been designed as an introduction to computers. Because of the wide variety of computers used in instruction as well as in business or at home, the material in this manual is as generic as possible. That is, we have tried to provide you with general concepts and skills that are useful to the user regardless of the type of machine or software he/she might be using. The overall goals of Unit I are to:

- help participants gain a sense of mastery over the machine by understanding how it works
- provide an opportunity for people to consider the potential impact of this technology on themselves as well as their community
- practice using the computer by applying it to specific applications
- practice using the skills that make the computer an effective and useful tool
- learn the parts of a computer and their functions

- practice using the computer with a variety of programs
- learn some basics about programming
- write a simple program
- discuss the development of computers and their potential impact on Idaho citizens
- learn how computers are used in schools, on the job and in the home
- use the computer to perform calculations
- develop criteria for evaluating software programs
- write using a word processing program
- discuss how each person will use the information he/she has learned

Computer Literacy for Rural Adults: An Overview

The READI project was funded to do more than just pilot a potentially successful educational program; it is also an experiment in what kinds of educational strategies are most effective for rural adults experiencing change because of economic dislocation or technological advances. The strategy used by the READI Program is based on the belief that educational opportunities that provide rural adults with skills in problem solving as well as resources for planning effective uses for technology, are factors in creating economic development that helps individuals and communities appropriate technology to their own best use. In some cases, an individual's participation in READI may result in anything from new jobs skills or educational opportunities to embarking on a small business venture. In other cases, the READI project has been a catalyst to helping communities plan effective methods of integrating new technology into the community in both the private and the public spheres.

Since READI aims at being more than just another educational program on computers, the project has addressed several issues including: developing a definition of computer literacy that is meaningful to rural adults, understanding the potential role of computers in Idaho communities and providing resources for reviewing or developing the noncomputer skills necessary to use computers effectively. These computer readiness skills include not only the basic reading, writing and arithmetic, but also problem-solving, decision-making and management skills. The project has worked hard to develop a definition of computer literacy that is appropriate and useful to both extension and adults in Idaho.

Computer Literacy — In developing this program on computer literacy, the READI Project created a definition of computer literacy that we believe is appropriate and useful to both Extension programs and adults in Idaho. Specifically, the READI definition of computer literacy is based on the idea that learning the technology, while essential to using a computer effectively, is not enough. To be computer literate, people must also know how to apply computer power to a variety of everyday situations. Finally, computer literacy means that people must also have an understanding of what the impact of computers will be for individuals as well as communities.

In order to become computer literate, therefore, individuals must become acquainted with the following:

- the terminology used when working with computers,
- how computers use and store information.

- what data are and how it can be manipulated.
- how to tell computers what to do with data,
- how to effectively apply software,
- how to use computer skills in your own life, and
- what the introduction of computers will mean for local schools, businesses, farms and families.

Thus, for the READI Project, computer literacy means much more than being able to boot a program or even write a program. It means learning about this technology in order to be aware of what its limitations, as well as its benefits, are. It also means learning ways of controlling, or at least influencing, the way in which technology will influence our future.

Programming: Essential Skill or Waste of Time— The inclusion of programming in our definition of computer literacy is, at the very least, controversial. While a few years ago computer literacy often meant programming, today the trend in computer education is away from programming and toward applying computers only within specific disciplines. After all, many educators point out we don't have automobile literacy, but nearly everyone manages to drive their automobile satisfactorily.

We have retained an introduction to programming as an essential part of computer literacy for several reasons. For many people, the ability to tell the computer what to do and have it really do it is an important step in developing a sense of mastery or control over the technology. While successfully using a software package to achieve a particular end is also satisfying, in our experience there seems to be nothing like writing your own program and running it for achieving a sense of who is really the boss.

Second, and equally important, teaching programming helps people understand the importance of organizing their information. Since much of our experience does not require tight organizational development, many of us need to learn the importance of organizing our data for effective computer use. Working with programming activities gives us an opportunity to see how important the organization of information is to the successful use of computer power.

Computer READiness Skills

Just as computers require better, more concise organization of information, they also require the user to have skills in using data or information. The computer can no more choose the correct formula than it can choose the right spelling of a word. The understanding of math that goes into developing a budget or the writing skills that go into preparing a letter are essential to one's ability to use the computer effectively. Unit I of the READI Program, therefore, will provide reviews of basic skills necessary for a particular computer use as that use is presented.

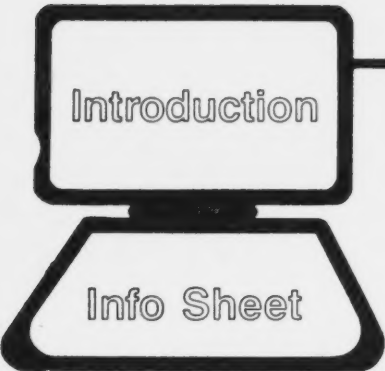
Computers in Idaho

READI is in response to several factors. Economic pressures during the past decade have meant changes for many people. Farms and small businesses have had to develop better management skills in order to survive. Many workers have had to cope with high unemployment. Future projections for mining, fishing and wood products industries indicate many of these jobs are gone forever. Others are being forced off the farm and into other types of work. Retraining, therefore, is likely to become a necessity for many Idaho workers. In addition, women are entering the job market in larger numbers than ever before. Both these new workers and those that require retraining are likely to need some technological skills to find reasonable work. Thus, learning about computers can impact both an individual's job possibilities as well as the possibilities for economic development in existing communities.

Another factor is that computers are playing an ever more central role in education. Many schools have introduced computers into the classroom, and some colleges require a computer science class for graduation. For parents, this can mean an increase in the generation gap as technological know-how increases the distance between parents and children. For adult learners, this can mean that many of the programs they are interested in require some computer knowledge for participation. Extension, which has programs relevant to all of these concerns, is, thus, interested in providing adults with the basic tools necessary to participate more fully in new developments in education, both as parents and as learners. READI has been designed to provide this basic introduction to computers.

READI is also a response to the way in which computers are making a difference on the domestic front. With the exception of home finances, this application has trailed behind. With the development of more user-friendly machines and software, however, more and more people are finding ways the computer can help with home management.

As you work through Unit I, you will have an opportunity to deal with each of these areas. We hope that the information you learn, the skills you develop and the resources you become acquainted with provide you with the background you need to create your own computer-using future.



Introduction

Info Sheet

Manual Organization

The material in this manual will supplement the activities and information gained in this class. While your instructor will provide you with much information, because we believe that people learn best by doing, most of the class time will be spent with the computer or working in small groups.

- Introduction
- Sessions I through VIII
- Resource list

Each session contains an overview, one or more information sheets, a worksheet and a log sheet. The session overview gives a brief introduction to the session and lists the learning objectives around which the session has been organized. The information sheets are included to give you some background and reference material on various topics, and the worksheets provide an opportunity for you to work on mastering the skills presented. The log sheet makes it possible for you to keep a log or a journal during the class. You may use this space to record what you have learned, to write out questions or list topics that are confusing, to think about how you will use what you have learned, to write about your feelings or to complete a specific assignment your facilitator/teacher may give you.

Finally, the resource section includes a list of additional materials and resources and space to add others you find that may be useful. Included in the resource section is a glossary. You will probably find it necessary to refer to it during each session.

Session I

Overview

Introduction to Computers

Computers are becoming more and more a part of everyday life. We can find examples of how computers are becoming more commonplace in banks, grocery stores, libraries, retail sales and government offices. At the same time, it is becoming more and more common to find them in the home, on the farm or in small businesses. New developments in technology have made all this possible by making computers cheaper, smaller and easier to use.

New opportunities have also created new problems. For example, many people do not have access to computers and still others have never learned to use them comfortably. In this session we will introduce you to the microcomputer and talk a little about the potential impact, both positive and negative, of computers in our lives. During this session, therefore, you will:

- have an opportunity to use a computer
- meet the other participants
- learn about the components in a computer system
- learn what a computer can and can't do
- have an opportunity to talk about your expectations for the course
- start a computer and boot a program
- begin learning some computer terminology

What Is a Computer?

What is a computer? A computer is simply a tool. This tool can be applied to many different situations including home entertainment needs, bookkeeping, record keeping, word processing, etc. In the resource section of the manual there is a list of 14 different ways this tool can work for you. How you will use the computer depends on your personal and/or family goals and needs. Like any tool, to be effective the computer requires a skilled user. And using it is a skill that, like other skills, requires patience and practice.

What a Computer Is Not — It is not a decision maker or problem solver. Despite the power of the computer, all decisions and many problem-solving situations require subjective input — your ideas, values and common sense.

Computers are not always right. Computers can only give you right answers if you give them right information. Computers cannot know when the information they receive is faulty, thus, the origin of the saying, GIGO, garbage in - garbage out.

Finally, a computer will not in and of itself save you money. To purchase a computer requires not only a sizable chunk of money, but also a sizable chunk of time to learn how to use it effectively. The profitability of any computer is, then, like that of any tool. The tool must be appropriate for the task at hand. Your own goals in investing in a computer system will determine the value you get from it. If you learn to use it effectively and well, it probably can, in the long run, expand your capabilities and provide you with a payoff.

Components of a Computer System

The personal computer system requires three types of components: hardware, software and a knowledgeable user.

Hardware

When hardware is mentioned, we often think of physical pieces such as printers, monitors, computers and disk drives or cassettes. While the computer console itself is responsible for processing data, other hardware items are responsible for inputting and/or outputting data.

The most common method for inputting information is with a keyboard. Other methods include number pads, game paddles and use of the mouse. Once the computer has taken your information and worked with it, it must also have the means to give back the results. Several common devices that help the computer with its output function are the video monitor and the printer. Other components on a computer system can both input and output information. Modems (devices that allow you to communicate with other computers via telephone lines) can also input or download data and output or upload data information.

Most common among these input/output devices is the disk drive or cassette player. Either mechanism can provide information for the computer to use or be a place to store information the computer has processed. Since computers not only have limited storage space but also lose any information stored in the RAM (Random Access Memory) when they are turned off, mass storage devices such as disks and tapes are important parts of your computer system.

Software*

Hardware, however, is only part of a computer system. The computer itself is very limited without appropriate and effective software. The term software refers to the programs that give the computer instructions on how to carry out a task. While you may very well enjoy programming and eventually may develop some of your own software, commercially available and public domain software packages are important parts of the average user's computer system.

While a program is the actual instructions to the computer, a software package generally refers to the disk the program is stored on and instructions for using it. These instructions are often referred to as documentation and are an important part of the package. Many good programs gather dust because the instructions are too hard to follow. These programs may help you effectively apply computer power to your situation.

The User

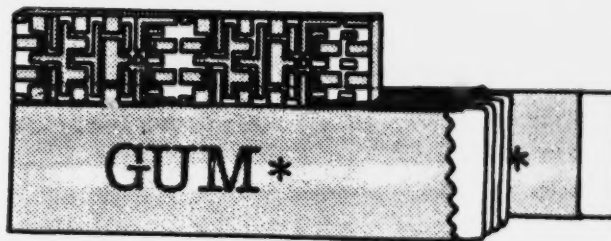
Finally, no computer system is complete without the user — you. In order to effectively pull your share of the load, you, the user, must learn how the computer works, how to evaluate software and, most important, how to control the computer so it does what you want. Furthermore, control is closely related to comfort. That is, you need to feel comfortable with the computer and the idea of computing in order to learn how to effectively control the computer. If you are not comfortable or do not feel in control, take steps to change these feelings by asking questions, practicing more often and writing or talking about your feelings. Be sure to take the back or top off the computer to look inside and see these parts during this first session.

Computer System Components*

This section will introduce some important terms and concepts.

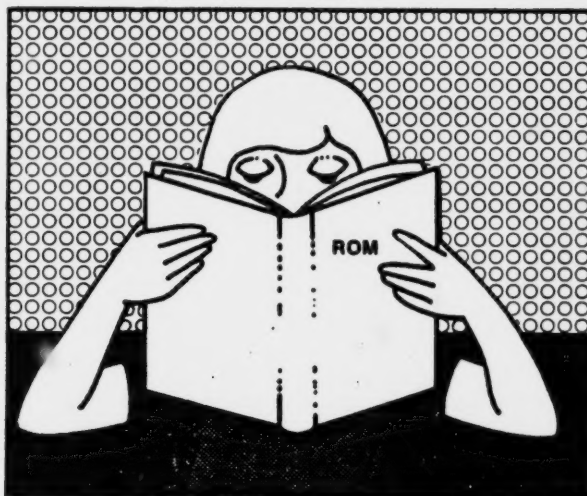
Central Processing Unit — The CPU is the brain of the computer. In microcomputers the CPU is a complex integrated circuit called a MICROPROCESSOR. The CPU is located on the main control board; it receives, manipulates and directs the electronic signals to all the other computer components. If possible, take the back or top off the computer to look inside and see these parts during this first session.

*Adapted from the 4-H Computer Literacy Project at Washington, Oregon and Idaho Cooperative Extension Services.



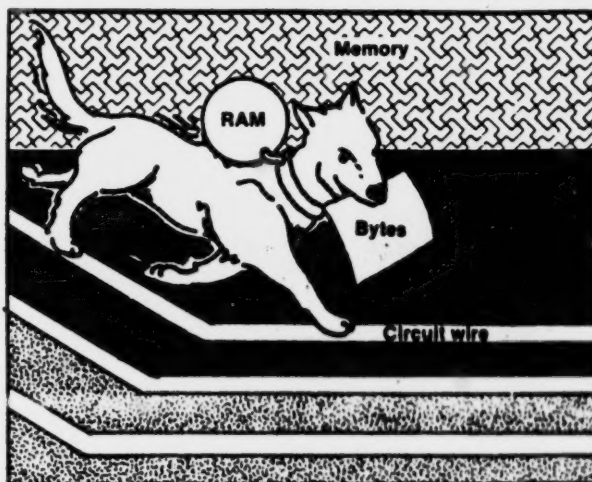
Memory — In order for the CPU to perform useful work, the computer must have the ability to store information or data. Since the computer is based fundamentally on an on/off system, information is stored in a binary fashion or on an on/off basis. Each on or off signal is referred to as a bit. A BYTE is a group of bits. How much information your computer can store is based on the number of bytes it can store.

The ability to store data internally or within the computer is known as MEMORY. The memory section of the computer is composed of solid-state devices known as CHIPS. One chip is about $\frac{1}{2}$ x 2 inches in size and $\frac{1}{4}$ inch thick with 16 to 32 terminal connections. The average chip has a memory of 1K (1024) to 2K bytes, but researchers are producing smaller chips with more memory. That's equivalent to a short written report in a package smaller than a stick of gum. Memory can be either ROM or RAM.

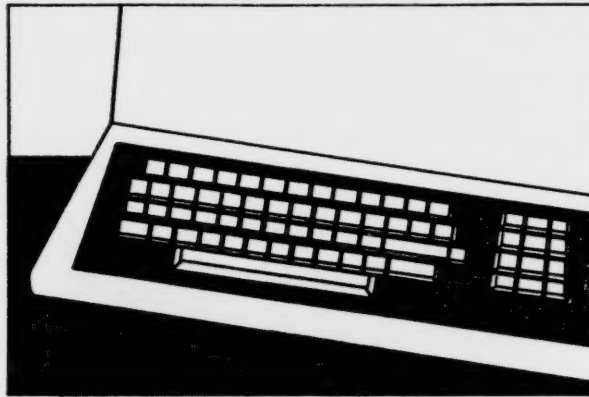


ROM is Read-Only-Memory. In the ROM, the CPU can only ask for or read what's stored in ROM; it cannot store anything there. ROM data cannot be modified or erased. Special instruments, equipment and well-trained people have permanently "imprinted" information in the ROM of your computer. The BASIC language instructions and many other operating procedures are often stored in the ROM.

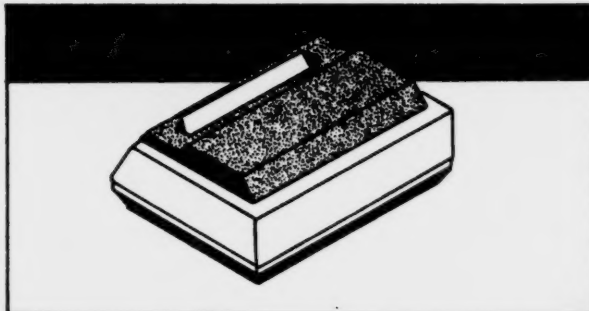
RAM is Random-Access-Memory. This is the memory that can be used to store information you type into the computer and then "randomly" recall. That is, you can access the memory for both storage and recall at any time. RAM is generally the add-on type (16K, 32K, 48K, etc., sizes).



Keyboard — The keyboard is the tool you will most often use to communicate with the computer. The keyboard serves the functions of letting the operator select and construct instructions to enter into the computer and to type information and data required in specific programs.

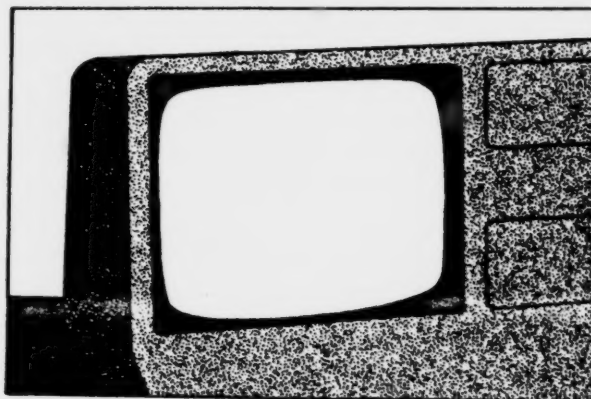


Printer — In order to have permanent records of computer output, you must have a printer. With the video display, the computer output is visible only as long as you keep it on the screen. With a printer you can have a permanent printed or hard copy of the computer output. Many types of printers are available. In addition, some electric typewriters can be adapted and connected to a computer.



Video Display — The video display is the direct opposite of the keyboard for it is the computer's means of "communicating" to the operator. The video display is a cathode ray tube (CRT) just like a black and white television. Its function is to give a visual display of the computer's output.

With special electronic adapters and converters, any TV set can serve as a video display for the computer, but the quality is not as good as regular television viewing.



Storage Systems

Many microcomputers use magnetic storage media for permanent external storage devices of data, programs and various types of files. There are a variety of different storage devices, but, generally, people use either a cassette tape or a diskette. Recently, a number of computer manufacturers have begun marketing hard disks. These disks remain inside a special disk drive component. They are useful to people who store large amounts of data because they can hold more than a floppy diskette.

Cassette Tapes — Cassette tapes are an economical method for storing information generated by a microcomputer. These tapes have magnetic impulses that the computer can interpret. If, however, you were to listen to the tape, it would sound like "static" or a high-pitched tone.

Cassette tapes used for digital computer data must be much better quality than the tapes used for music reproduction. Data are stored on a cassette tape at 500 or 1,500 bits of data each second. Even the smallest flaw in the tape could produce a useless tape since the loss of only one bit would produce inaccurate information. Therefore, the cassette tapes used with computers should be rated as "digital" quality.



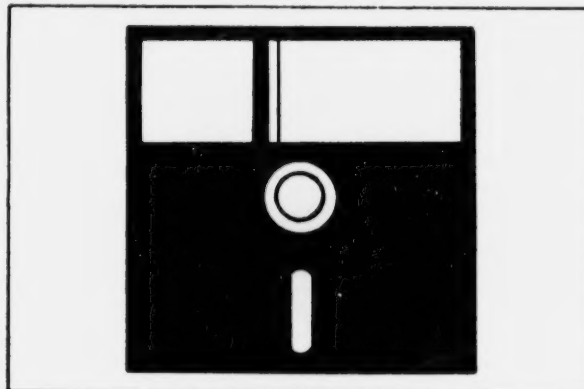
To use a cassette tape with a microcomputer, you must load the cassette into a tape recorder, and the recorder must be connected to the computer. You will need to study the manual for the computer you will be using for instructions on exactly how to use the cassette system. Correct usage is absolutely vital to your success with the computer. Guidelines to follow include:

1. Do not touch the exposed cassette tape.
2. Keep cassette tape within a temperature range of 52°F to 125°F.
3. Keep cassette tape away from electrical or magnetic fields.
4. Store cassette tape in a plastic box for protection from dust, dirt, etc.

Diskettes — Diskettes are similar to cassette tapes in that information is stored on a magnetic film. Diskettes, however, have more storage capacity than cassette tapes. Most diskettes are round, flexible disks that are magnetically coated.

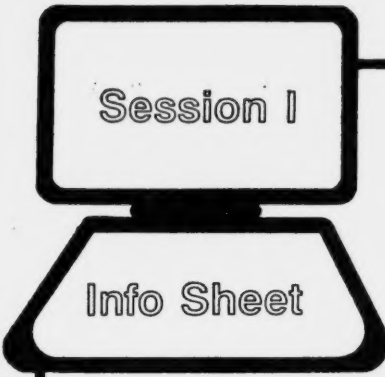
The diskette looks similar to a small phonograph record. To use a diskette, insert it into a "slot opening" in the "disk drive," close the small flap door, and the computer will then be ready to respond to your commands. Each computer has its own unique system, so you will need to study the manual for your computer to learn how to use the diskette and disk drive.

Diskettes come in several sizes. The majority of home computers use 5 1/4-inch floppy disks. In addition, hard disks with more storage capacity are increasingly available for many personal computers.



Diskettes must be handled carefully or they will not operate correctly. Observe the following rules of use:

1. Do not touch exposed parts of the diskette.
2. Do not bend or crimp a diskette.
3. Keep diskette within a temperature range of 50°F to 125°F.
4. Keep diskette away from electrical or magnetic fields.
5. When inserting the diskette insert gently but fully into the drive position. Be sure the diskette label is positioned according to the instructions for the computer you are using.
6. Store your diskette in a cover envelope to protect it from dust, dirt, etc.



Session I

Info Sheet

Getting Where You Want To Go: Cursor Control

One of the things about a computer that makes it different from a typewriter is that you can move all over the screen page. While the typewriter moves only left to right and up to down, the computer is designed to let you go anywhere you want on the page. Your position is marked by a blinking line or block. This point is called a **CURSOR**. Every machine has a way of controlling the movement of the cursor when you are in immediate or programming modes. While most software programs have their own set of commands for controlling cursor movement, the following are common to cursor control on most computers.

Arrow Keys — Computers have **ARROW** keys that move the cursor to the left or to the right. Arrow keys also move the cursor up and down. Usually each time you use the key, you move one space or one line.

Scrolling — Most machines also have a mechanism for moving whole pages up or down, or whole lines across. This is referred to as **SCROLLING**. Each machine has a different method for scrolling. Check with your instructor or your manual to learn how to scroll on the machine you are using.

Correcting Errors — While a typing error made with a regular typewriter can mean starting over, the computer is very forgiving about such things. Each machine has a way of erasing mistakes electronically. On some machines, this is done with the **BACKSPACE ARROW** key, while other machines may use a **DELETE** key. Learn how to correct mistakes on the machine you are using and practice a few times until you are comfortable with erasing mistakes electronically.

Type of Cursors — Often software programs will refer to two types of cursor movement, **OVERSTRIKE** and **INSERT**. The overstrike cursor types the new data right over the top of the old, while the insert cursor squeezes in the new material without changing the old. These distinctions become more important as you begin to use more complicated software packages, especially word processing programs.

?HELP?: What To Do When You Don't Know What To Do

Introduction

Sometimes people believe that the confusion involved in learning to use a computer makes it not worth the trouble to access the power it can provide. You can ask anyone who has used a computer, and he/she will tell you it can be as frustrating as it can be rewarding. Some people, however, make it through the problems to go on and learn more, while others become frustrated and never overcome the barriers to using the machine effectively. We have included below some of the strategies those who persist have used to help them over the hurdles.

HELP Menus

In the writing of many programs, the authors try to predict where the user will need help and then add what is often called a HELP MENU. With some programs, all you need to do is type a ? to get to the help menu, while others have a help section in each part of the program. Whenever you begin to use a new program, find out how to access the help menu and review the contents so you will know where to look for help.

Documentation

Most commercial programs have some DOCUMENTATION. This documentation is often referred to as a USER'S GUIDE. Documentation exists not only for software programs, but also for the computer, disk operating system, printer, etc. Sometimes the information on how to use a program is right on the disk, but generally it is in the form of a manual or pamphlet.

The user's guides material is designed to do several things. First, the user's guide should walk you through the program. This part of the manual is often referred to as a TUTORIAL, and some programs also include a tutorial or demonstration disk to accompany this hands-on introduction. Second, most documentation includes a resource section that goes over part of the program and explains the options in depth. A good user's guide also lists error messages, provides a short guide to the program functions and gives information on how to work with different printers.

Review the documentation accompanying the machine you are using to see how easy it is to use by trying to find the answer to a question you would ordinarily ask the instructor. The more complicated the program, the more important the documentation is for successfully using the software. Many very powerful and useful software packages lay unused because the documentation is so poorly written that the user can't get the information he/she needs to access the power of that program. Before buying any software, review the documentation and see how difficult it is to find answers to questions.

What If I Can't Find The Answer: What Next?

If the documentation and your own problem solving skills fail to get you past a particular frustration, don't give up. There are four additional resources that you can go to that may be of help.

Helplines — First, most commercial programs and many educational programs have a help telephone number. Generally, it is an 800 number, so the company pays for the call. Some of these hotlines, as with documentation, are better than others. But they are a good next step. Try it sometime soon and see what kind of help you get.

Retailers — Another good source of information and help is the company from which you bought your machine or software. Call them up and explain your problem. Who knows — maybe the question you have will help them give better service to other customers.

Educational Institutions — Many educational institutions have computer labs. Some have lab assistants on duty at all times; others use the labs in a classroom context. Generally, however, each school has a computer hacker somewhere who would love to apply his/her skills to helping you solve your problem.

User's Groups — One of the best ways to learn more about your computer, however, is to get involved with a USER'S GROUP. Depending on your area, there may be one group with all kinds of people, or there may be groups of people organized around the type of computer used, or even some groups organized around a particular application. Some groups are large and well organized, while others meet for coffee at someone's home once a month. Find out about the user's groups in your area and visit a group to see what it is like. User's groups are also a good place to pick up public domain programs (public domain programs are not copyrighted and can be copied by anyone) as well as to share the results of your own programming prowess.

Session I

Worksheet

While much of Session I has been spent looking at those elements most computers have in common, it is important to be aware of the special characteristics of the computers you will be using. After working with your machine, you can use this worksheet to find out more about the specific computer with which you are working. Some of this information may be found in the documentation for the computer.

1. The computer I am using is a _____.
2. It has _____ K memory.
3. It uses a _____ as an external storage device.
4. The procedure for booting a program is _____.
5. The cursor movement is controlled by _____.
6. I can scroll the screen by _____.
7. The way I correct an error on this computer is _____.
8. Some other interesting things I have learned about this computer are: _____

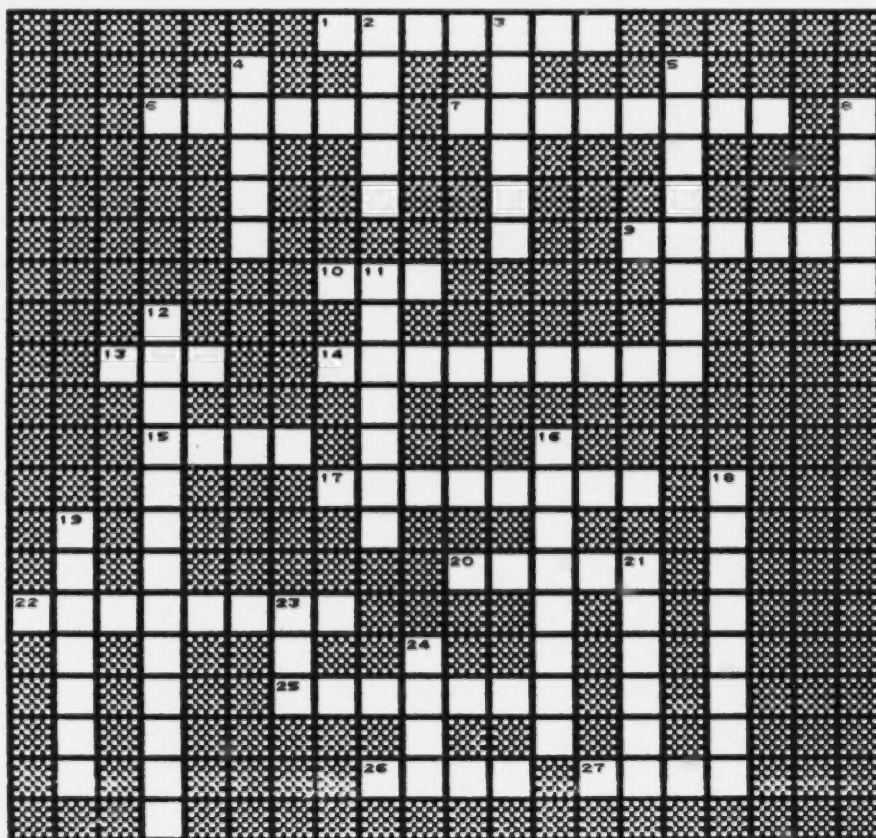
9. The owner's manual tells me that the way to print to printer is _____

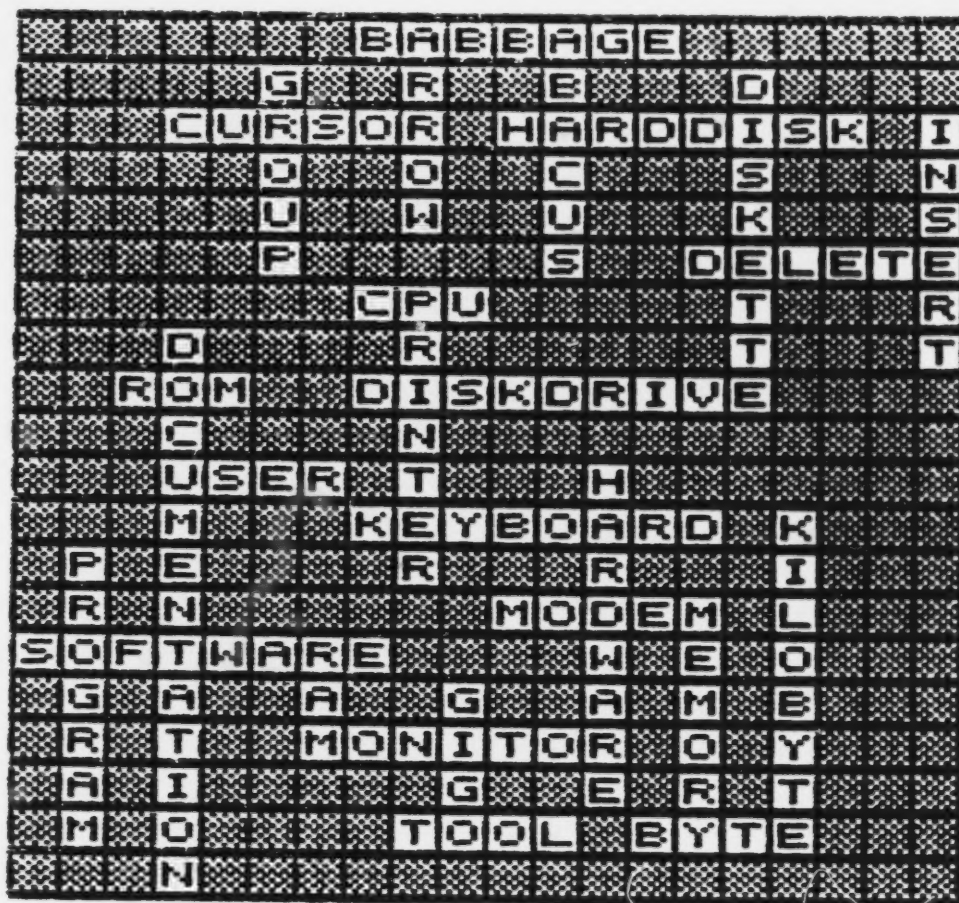
Across Clues

1. Father of computers
6. Blinking line or block that marks your location on the screen
7. _____ drives can usually store 10 or 15 K of information (two words)
9. Key used to erase mistakes on the screen.
10. The brain of the computer
13. Part of memory that permanently stores the operating system
14. Device used to store information on diskettes (two words)
15. Name for person operating the machine
17. Most common device for inputting information
20. Hardware that allows you to talk to other computers on the phone
22. Term that refers to programs
25. Visual display of computer's output
26. The computer is simply a management _____, not a manager.
27. A group of bits

Down Clues

2. Keys used to move the cursor on the screen
3. Device used more than 3,000 years ago for complicated counting
4. User's _____ are clubs made up of people interested in computers, that make a good resource for reference
5. Common device that is round, magnetically coated and used to store information on
8. To squeeze in new material without changing the old
11. Device used to make hard copy of computer output
12. Good resource, supplied by the manufacturer of hardware or software
16. Physical pieces of a computer and its peripherals
18. 1024 bytes
19. List of instructions to the computer
21. Gives computer to store information and data
23. Memory that can be used to store information you type into the computer
24. Garbage in/garbage out





Session I

Entry Log

The Daily Log Or Journal Entry

As part of this class on computers, you will be asked to keep a log book or journal. This is important to your progress in several ways. First, the journal or log book provides a place for you to record your feelings, both the frustrations you encounter and the joys of your accomplishments. It will also provide a space for you to record your questions and concerns, as well as any information that will help you improve your computer skills.

A second reason for including the journal or log assignment in this curriculum has to do with the results of research on how people learn. This research shows that writing about a process or problem helps the learner clarify his/her thinking and organize ideas. We hope that by using the log book you will be able to more critically use that information.

Another reason for keeping a log book or journal is that many of us have allowed our writing skills to become rusty with lack of use. Writing on a regular basis will help us polish these skills. This practice will help you develop and use more effectively those writing skills that are necessary for word processing and other computer applications.

A final consideration in keeping a journal or a log has to do with audience. Journals or logs, unlike diaries, are designed to be shared. Perhaps not every entry will become public because some entries will contain private information. But, in general, log entries are intended to be used. While some of us may be reluctant to discuss our feelings and thoughts, the process of sharing these entries is helpful to the learning process. Sharing your log entries will not only provide you with an opportunity to learn new things from other classmates, but it will also illustrate that most people have similar problems and questions. Discovering that others may be equally confused will help reduce everyone's anxiety. Sharing log entries with other group members will also help the group develop a sense of unity.

Session I

Entry Log

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MTA

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Programming

Most people will probably not become computer programmers; their use of the computer will depend on software someone else has developed. Nonetheless, many people feel a need to know something about what the computer can do, how it does it, and how it is programmed to do it. This session is designed as a brief introduction to programming so that you can develop a stronger feeling of control and mastery over this new technology.

In addition to programming, this session will also focus on problem-solving because this ability is important to working effectively with computers. Since everyone does some problem-solving, this session will provide an opportunity for you to share your skills with others and at the same time, learn some new techniques.

During this session, therefore, you will have the opportunity to:

- think about further developing the problem solving skills you already have,
- learn a basic approach to problem-solving and several problem-solving strategies
- apply problem solving to using the computer,
- learn and practice some common commands in BASIC,
- write a simple program,
- write a command/argument sequence to communicate with the computer.

Problem Solving

Problem-solving is a skill that is becoming more and more important in the home and in the classroom, as well as on the job. There are several reasons why problem-solving occupies such a primary place. First, because of technological innovations, jobs and job situations are changing so quickly that more and more workers must be able to figure out what to do without explicit guidelines. The same can also be said about home life and educational settings. At the same time that problem solving has become so important, however, the *National Assessment of Educational Progress* in 1982 reported that . . . "although students perform arithmetic skills adequately, they are not able to use their skills to solve problems." Thus, the increased need for problem-solving skills on the job, coupled with the fact that many people are not skilled in this area, has made problem-solving one of the most sought after skills listed by employers.

Secondly, problem-solving is a generic skill; it transfers to all areas of life, not just computers and math. Thus, the ability to use problem-solving skills can affect all parts of life from relationships to checkbooks. Finally, much of the work you do with the computer will involve problem-solving.

When Do I Apply My Problem Solving Skills?

Use your problem-solving strategies checklist and the problem-solving process diagram included in this section whenever you encounter a problem. A problem can be considered as a situation where a person is seeking a goal or answer for which there is no immediate and/or suitable course of action.

Although confronting a new problem is often confusing, effective problem-solving can be used to help work through that confusion. Effective problem-solving depends on an understanding of what the goal or solution should be. In addition, people generally will only exert the effort to apply problem-solving skills if they are motivated to do so. What motivates people depends on their own history, value structure and the external conditions. Finally, problem-solving always involves some manipulation of information. Each problem requires searching through information and organizing it in order to solve that problem. From the problems you have encountered in real life, you know the importance of collecting data or information and applying some method of evaluating that information. Thus, problem-solving requires us to use our past experience and our acquired skills to reason through a new situation.

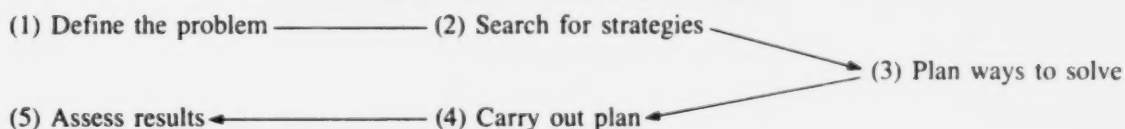
In summary, dealing with a situation with no apparent solution requires identification of goal motivation of the problem-solver and the manipulating information. Without the first two steps, the computer's ability to manipulate information will be useless.

How Do I Do It?

According to one math educator, what you have been obliged to discover by yourself leaves a path in your mind which you can use again when the need arises. Each person has his/her own history of problem-solving and a unique approach to working on a problem. Whatever the method or approach, the problem-solving process indicates a starting point for working with the problem and provides a choice of alternative strategies if the first attempt fails.

While everyone has their own method of problem-solving, a process exists that is common to all good problem-solving efforts. This process is represented in the diagram below.

The Problem Solving Process



We encourage you to begin using this method in this class by:

1. Identifying or writing out the problem to be solved; that is, decide exactly what it is you want to know.
2. Review the possible strategies for approaching the problem.
3. Select the strategy you think will work best and develop a plan for applying it. At this point it is important to estimate the answer or decide on criteria for measuring success.
4. Plan and apply that strategy. If it doesn't work, go back to your review of possible strategies and use your second choice. Continue applying strategies until you find the answer or reach the goal.
5. Finally, review what you have done and evaluate your success, not only in reaching your goal or finding the answer, but also in using your problem-solving skills.
6. Continue applying strategies until you find the answer or reach the goal.
7. Finally, review what you have done and evaluate your success not only in reaching your goal or finding the answer, but also in using your problem solving skills.

Some problems are hard to solve and require many different strategies or combinations of approaches. It is important to realize that there is no magic solution to problem solving, although some of us are more experienced with it than others. Good problem solvers don't expect easy answers and often spend much time and energy on solving their problems suffering from false starts just as the rest of us do. Use the strategy sheet on the next page whenever you are stuck to help find a fresh approach.

Even though we all have a process for solving problems, some people have a harder time than others in applying that process to a problem. While a person may have difficulties because of an initial incorrect understanding of the problem, more often than not the stumbling blocks people experience with problem-solving are a result of anxiety. For many people, a past history of difficulty with problem-solving has blocked the path in their mind, creating a great deal of anxiety. This anxiety creates emotional blocks to problem-solving. Emotions, then, are often at the heart of problem-solving difficulties. Practicing working with problems in a non-threatening situation and talking about your feelings are effective ways of reducing the emotional block and providing better access to your own path to solving problem.

The following chart from EQUALS lists a number of problem-solving strategies. You will be using some of them during this class. Check back to this chart at the end of every session to keep track of the strategies you have used.

Strategy Checklist

Problem-Solving Strategies	Unit I	Unit II	Comments
1. Act It Out — Role Playing	_____	_____	_____
2. Move It Around	_____	_____	_____
Use manipulatives	_____	_____	_____
Sort or classify objects	_____	_____	_____
Measure it	_____	_____	_____
3. Picture It			
Draw a picture or diagram	_____	_____	_____
Close eyes and visualize all or part	_____	_____	_____
Use grid or arrays	_____	_____	_____
Look for patterns, likenesses, differences	_____	_____	_____
Make a tally or graph	_____	_____	_____
4. Take It Apart			
Break into smaller problems	_____	_____	_____
Work backward	_____	_____	_____
Look for key words	_____	_____	_____
Identify known, what is needed	_____	_____	_____
Identify excess or insufficient information	_____	_____	_____
5. Translate It			
Put into your own words, paraphrase	_____	_____	_____
Think of an earlier problem	_____	_____	_____
Translate directly into math symbols	_____	_____	_____
Put answers back into problem to check	_____	_____	_____
6. Control It			
Make a guess table	_____	_____	_____
Make a list	_____	_____	_____
Simplify (use smaller numbers)	_____	_____	_____
Estimate, predict	_____	_____	_____
Follow directions	_____	_____	_____
Check arithmetic computation	_____	_____	_____
Ask if it makes sense	_____	_____	_____
7. Other			
Do additional research	_____	_____	_____
Ask questions	_____	_____	_____
Talk to others	_____	_____	_____
Break set, let your mind go	_____	_____	_____
Sleep on it	_____	_____	_____

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Formatting or Initializing a Disk

Initializing the diskette places certain identifying information on the disk so it can be recognized and used by the system. Generally, two ways exist to format or initialize a blank disk so it will work on your system. An easy method to use is possible because many software programs, such as Word Star or VisiCalc, have a function within the program that you can initiate to take care of this task. It is possible, however, to program the formatting yourself. This is made possible by the fact that many computers have a command for this function. For example, with the Apple it is INIT. Generally, however, people also write a HELLO PROGRAM that tells something about the disk such as the date and the name of the user to label it. Before going to the next session, write a Hello program and initialize a disk.

Session II

Info Sheet

Introduction to Programming

The art or skill of programming allows you to communicate with a computer so that the computer will follow your instructions to complete a task. Like other forms of communication, the computer requires that you use a language it understands and that you use it in a logical fashion. Successful programming, then, means first learning to use a language the computer understands, and, second, organizing your communications with the computer in a logical fashion it can follow. Thus, the same characteristics that govern clear communication in any circumstance also apply to communicating with a computer. These characteristics include: brevity, conciseness, logical organization and purposefulness. In this session your instructor(s) will likely concentrate on learning some basics about the computer language called BASIC: Beginner's All Purpose Symbolic Instruction Code. Learning to use BASIC is complicated by the fact that each computer uses a different version of BASIC. The manual uses the APPLESOFT version in its examples. A chart illustrating the main commands for a variety of computers can be found in the resource section.

Learning a Program Language

While programming languages make it easier to communicate with computers, they still cause difficulty for the novice. One of the things that makes programming so difficult is the need for precision. This preciseness is important in any communication, but it is essential with a computer because, unlike a person, the computer has no subjective capabilities to allow it to either guess or pick up on implied meanings. Computers, in general, are also restricted to keyboard input; they cannot deduce meaning from your body language. Thus, computer language attaches precise meanings to the words it uses and also requires adherence to strict rules on how to use that language. Since most of the definitions of words used in computer languages are similar to their everyday use in English, the biggest problem people have is with the rules on how to use those words and symbols, often referred to as SYNTAX. You, like nearly everyone else, will get used to one of the most frustrating computer responses: ?SYNTAX ERROR.

One way to begin understanding how programming languages work is to think about our own language. In our language, we can speak to one another to communicate, or we can write down our thoughts for someone to read later. Similarly, you can work with the computer in IMMEDIATE MODE, which means it will respond on the spot, or you can use PROGRAMMING MODE. In the immediate mode, the computer is similar to a calculator or typewriter. In the programming mode the computer stores the information, but does not act on it until told to do so.

With the programming language, referred to as BASIC, the computer recognizes that the user is in the programming mode because each command is preceded by a line number. When the computer is given the command RUN, it begins with the lowest line number and completes each instruction until it has finished all the lines.

When we use our language to communicate, we rely on parts of speech, such as verbs, nouns, direct objects and pronouns to put our words into meaningful phrases. When these phrases can stand alone or are combined with other phrases to stand alone, they become sentences. Sentences are combined into paragraphs and finally, a combination of paragraphs becomes a complete communication. Let's look at how programming is similar.

Parts of Speech in BASIC

Remember learning about parts of speech in elementary school: verbs, nouns, pronouns, etc. Programming languages have an analogous set of words including: commands, variables, operators, relations and functions.

Commands — Commands tell the computer to do something. Many of them are similar to English in their meaning. For example, **NEW** tell the computer to start anew. **PRINT** tells it to put the information on screen, or depending on previous instructions, to send it to the printer.

Three types of commands exist in **BASIC**. First, there are commands that assign value. For example, in the line **LET A=5** we are telling the computer to give all A's the value of 5. Other commands relate to the **INPUT/OUTPUT** functions of the machine. For instance, the **PRINT** command tells the computer to output the results to screen or to the printer. Often the **INPUT** command is used to input information to the computer. Finally, there are commands that control the flow of the program as with **GOTO** which tells the program to stop its normal progression and jump to another line.

These control commands provide the programmer with many options because they can be unconditional, as with the **GOTO** command, or conditional. These commands, such as **IF** and **THEN**, provide some flexibility in the program. As you practice using the different commands, you will recognize that almost all programs have some way of inputting your information, processing that information and outputting that information. The following program gives examples of different commands.

*NEW	NEW	CONTROL
10 INPUT X=5	10 INPUT X=5	Input/Output
15 LET X=X+1	15 LET X= X+1	Assign Value
20 PRINT X	20 PRINT X+1	Input/Output
25 GOTO 15	25 IF X> 20, THEN 15	Control
30 END	30 END	Control

Variables — Programming languages often replace a word or a number with a reference or symbol referred to as a variable. A variable is used because the value or content of the variable varies depending on how the program is used. This mechanism allows you to write programs so that they can be applied to different situations. Therefore, if you were writing a program to figure miles per gallon, using variables allows you to change the value of a variable to accommodate different vehicles and driving conditions without changing the program.

While a program that dealt with miles per gallon would be inputting numerical values, the value of a variable can be characters, numbers (0-9) or letters (A-Z). Variables that use words or letters are often referred to as **STRING** variables, and they are designated by letters such as A, D or X followed by \$. Thus, string variables would look like: A\$, D\$ or Z\$. The \$ tells the computer that the content of this variable is not numeric.

Variables that have numeric value can take the form of any letter by itself. In the example above, **LET X=5**, we are assigning the variable, X, a specific value, 5. In doing so, we are first telling the computer to reserve a piece of its memory for X. And, second, we are informing the computer to put the value of 5 in that memory spot for the time being.

One way of thinking about how the computer uses variables is to think of a mail route. The mail carrier has assigned to his/her memory all of the mail boxes on that route. They are designated by the variables of mail box owners' names. The value or content of those mailboxes, however, changes with every mail delivery. Some boxes may remain unused.

*Examples follow Apple format.

Look at the two examples below. One program doesn't use variables and, therefore, would have to be re-written every time it was used, while Example A can be used successfully by anyone without changing the program.

Example A

```
NEW
10 PRINT "HI THERE"
15 INPUT N$
30 PRINT "HI THERE"; N$
40 END
```

Example B

```
NEW
10 PRINT "HELLO, SUE ANN"
15 END
```

Similarly, the following program uses a numerical variable:

```
NEW
10 PRINT "HOW OLD ARE YOU?"
20 INPUT A
30 PRINT "YOU WILL BE" : A + 14; " IN THE YEAR 2000"
40 END
```

In the program above, the user's age in the year 2000 is represented by $A + 14$ ($2000 - 1986$). In this one, $A + 14$ is referred to as an **EXPRESSION**. If the program had been written for one person or for people all of the same age, the value for the age in 2000, $36 + 14$, would be a **CONSTANT**. Once you use a constant in a program line, it will not change unless you change or modify the program.

Operators and Relations — Programming languages also have specific ways of telling the computer to add and subtract, recognize larger and smaller numbers, etc. **OPERATORS** include + for add, - for subtract, * for multiply and / for divide. Examples for keys that represent **RELATIONS** are > for "is smaller than," < for "is larger than," and = for "is equal to." These keys are fairly standard, but you may wish to check to see what keys do what on the machine you are using.

Functions — Computers also have built into their ROM a set of instructions on how to carry out specific mathematical functions such as: finding the square root of a number, using percents, squaring a value, etc. Check the documentation for your machine to find out what functions are available.

REM Statements — Although REM statements have nothing to do with how your program will run, they can be a great help to successful programming. REM stands for REMARK, and when the computer sees REM, it knows that this information is a note the programming has written to him/herself as a reminder. The computer, therefore, skips over this program line and goes on to the next instruction. For example:

```
NEW
10 REM "THIS IS A PROGRAM THAT SAYS HELLO TO THE USER"
15 PRINT "WHAT IS YOUR NAME?"
20 INPUT N$
25 PRINT "HI THERE; N$; !"
30 END
```

Sentence Structure or BASIC Program Lines

Just as we use parts of speech to develop sentences and phrases in English, we use the elements of BASIC to develop program lines. Because order is so important to working with computers, the first element in a program line is the **LINE NUMBER**. The line number is generally followed by a com-

mand. This command determines whether the line will give the computer data, ask it to output, process information, assign values or control the flow of the program. In general, most commands must have something to operate on, often referred to in programming jargon as an argument. Below are some examples of program lines:

line #	command	argument
10	PRINT	"TYPE YOUR NAME"
20	INPUT	4+5
30	GOTO	35
40	IF	X=5 THEN GO TO 45
	THEN GOTO	45

Punctuation

One of the most confusing things about using BASIC is knowing the rules for punctuation. While in regular writing incorrect punctuation can create confusion, it usually doesn't keep the reader from understanding the author's meaning. With a computer, however, incorrect punctuation will confuse it utterly, and it will respond with, ?SYNTAX ERROR. To make things more confusing, punctuation differs a great deal from one type of BASIC to another.

Check with your instructor or the manual to find out how to:

- set a tab
- put more than one thing on a line
- go to the next line
- when to use commas and semicolons
- when to use quotes

You will also receive a SYNTAX ERROR if something is spelled incorrectly or if it is in the wrong order.

Building Paragraphs by Using Subroutines

Just as a paragraph is a collection of sentences about a common topic, subroutines are groups of program lines related to one task. One difference, however, between paragraphs in writing prose and subroutines in programming is that the control commands such as GOTO, or IF, THEN, make it possible to use the same subroutine many times. As you work with various software packages, you will see examples of one subroutine used several times, for instance help menus.

In the guessing game program below, the subroutine is used with control statements to tell the user to guess again.

NEW

```
10 REM "THIS DETERMINES THE NUMBER TO BE GUESSED"
15 IF X > 9, LET Y = X+1
16 IF X < 9, LET Y = X-1
20 REM "THIS TELLS THE USER WHAT TO DO"
25 PRINT "THIS IS A GUESSING GAME. WHEN YOU SEE"
30 PRINT "THE ? GUESS A NUMBER BETWEEN 0 AND 10"
35 INPUT X
40 IF X = Y, THEN END
45 PRINT "THAT IS NOT IT, GUESS AGAIN"
50 GO TO 25
```



Flow Charting

Learning the language and the rules for communicating in that language is not enough to become a good programmer. It is also essential to learn to carefully and precisely structure ideas and information. This organization is essential because the computer can only follow directions. It cannot make assumptions about what you really meant it to do. For this reason, it is suggested that you write out your program before you put it into the computer. One way to do this is to write instructions or directions in one column and the translation into computer language in the next column. For example:

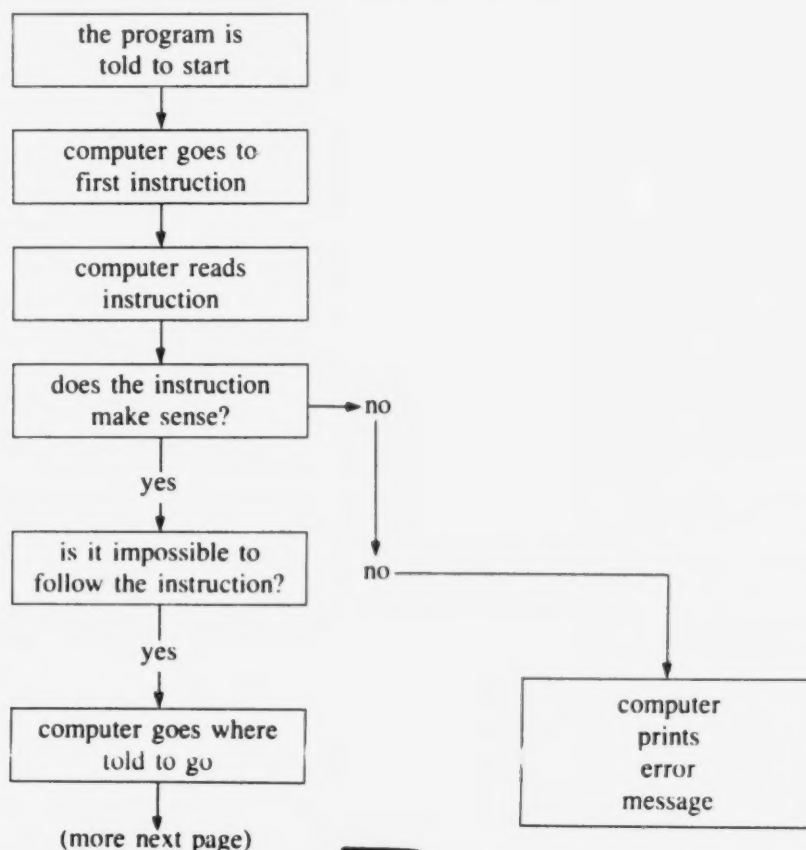
Instructions

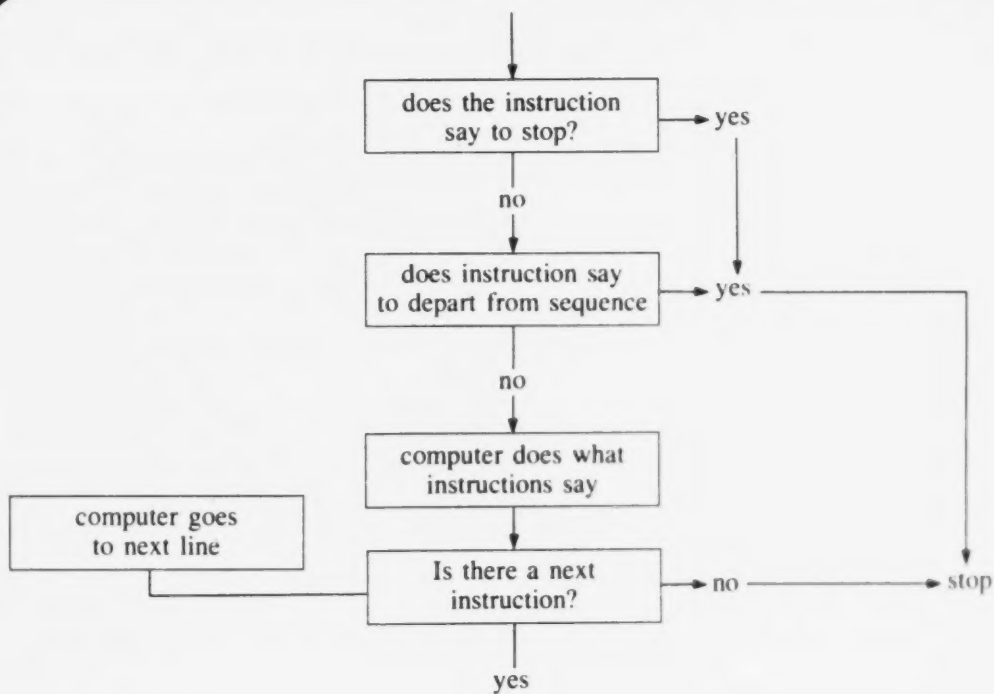
1. Ask me my name
2. Say hello to me

Program

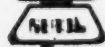
```
10 Print "WHAT IS YOUR NAME?"  
20 INPUT A$  
30 PRINT HELLO A$  
40 END
```

Another method for doing this is to draw a diagram of what you want to have happen. The convention in programming is to use flow charts to accomplish this purpose. Flow charts will be covered more fully in Session IV, but it is an extremely important concept about which to begin learning. Below is an example of a flow chart* on how computers read programs.





*This flow chart of a computer program is adapted from *Instructional Computing for Today's Teachers*, by Vockey and Rivers

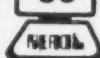


Keyboarding Tips

Typing errors are the most common reason for program 'bugs'. Below are some suggestions for avoiding them.

1. Often you will want to enter a program designed by someone else, before entering any data, carefully read instructions. Make sure your computer has enough memory and the right peripherals for the program to run.
2. Begin by typing in short programs to get used to your computer and programming. Type in long programs in stages, saving each segment as you go.
3. Boredom and fatigue can lead to many errors. Take a break and come back to your task later if you are tired or bored.
4. Assume that every character, space and punctuation mark in a program must be copied exactly.
5. Ninety percent of all programming errors occur in DATA statements, those long lines of numbers and characters that often appear incomprehensible. Try having someone read them to you as you type them in. If trouble still occurs, proofread from a printout. Again, a helpful partner can aid in this process by checking your printout against the program listing.
6. Sometimes program listings look different on your screen. Make sure to press RETURN or ENTER only when the program listing indicates it with a lone number, regardless of how long the line is in the listing.
7. An easy way to correct errors is to retype the entire line. Pressing ENTER or RETURN will replace the old flawed line with the new one.
8. If 'bugs' appear in your program, write down the error messages the computer sends you. The OWNER'S MANUAL will have a list of error messages and their meanings if you need help understanding the message.
9. Be sure to save your corrected program before typing in RUN.
10. Check to make sure you have not inadvertently swapped the letter O for the number 0 or a small l for a number 1, switched upper case text for lower case text and vice versa, or miscounted spaces.
11. If all else fails, turn off the computer and try again tomorrow when your levels of exhaustion and frustration are lower.

(Adapted from Family Computing, February 1986; page 40.)



Session II

Worksheet

Below are listed some of the concepts and ideas discussed in this session. Use this sheet to write in the specific commands or information you need to know to use the computer with which you are working.

I. Information on My Computer:

programming language(s)

prompt to let me know which is which

how to get my computer's attention

how to stop execution

how to enter a command

how to initialize a disk

A Hello program on my computer would look like: _____

II. Commands on My Computer:

clear

enter/return

stop execution

new program

clear the screen

print to the video

III. Programming My Computer:

set a tab

when to use a comma

when to use a semicolon

when to use quotes

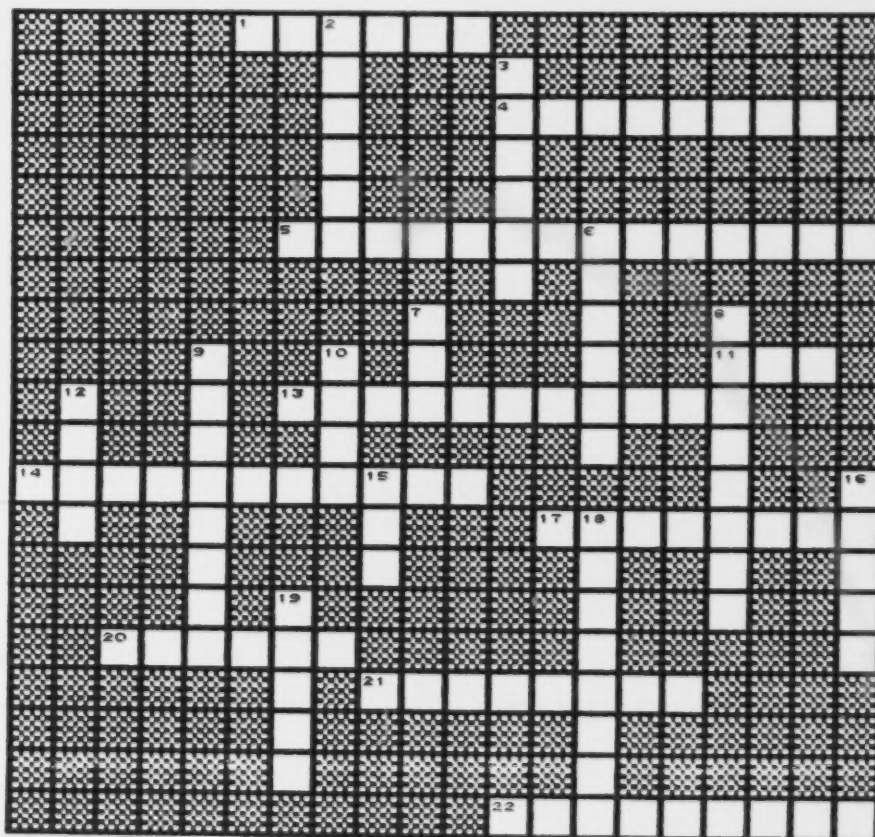
other important information

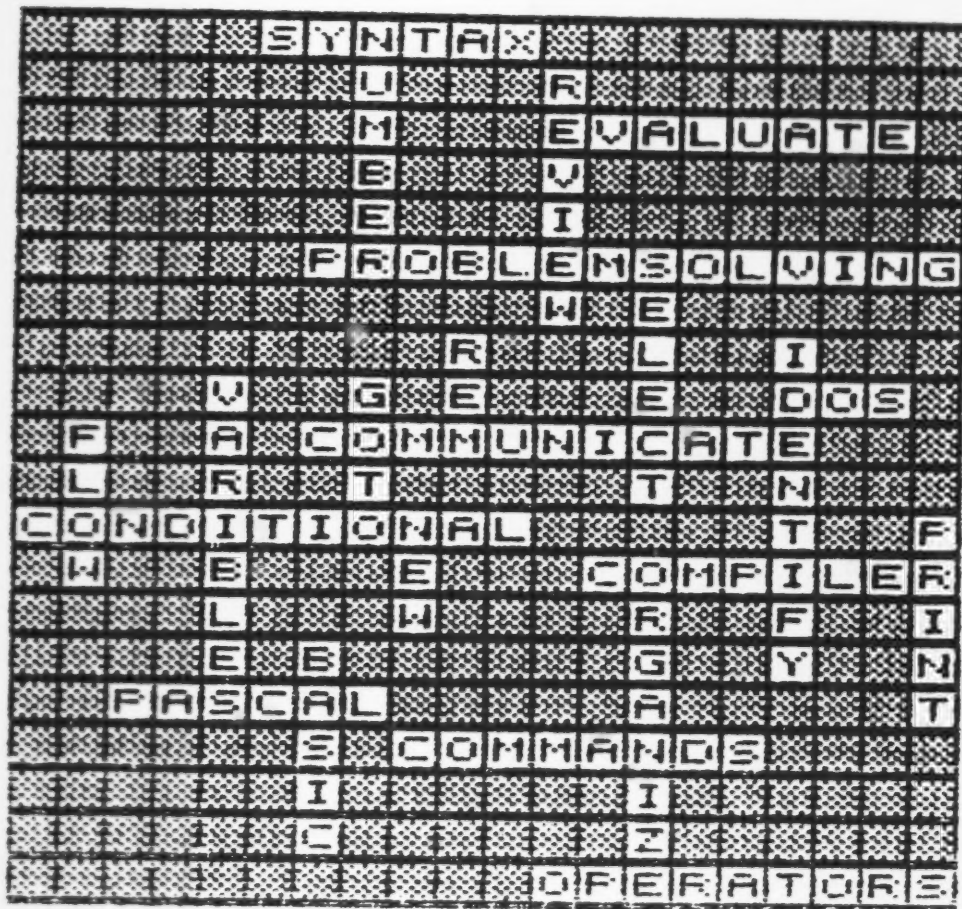
Across Clues

1. An error in text
4. Step 3 in problem solving is to _____ the possible strategies
5. Necessary skill used in the development of programs
11. Disk Operating System
13. Programming languages make it easier to _____ with computers
14. An if/then statement is a _____ command
17. This program translates languages into machine language
20. A computer language
21. (IF/THEN, GOTO, NEW) are all _____
22. (+, -, /, *) are all _____

Down Clues

2. A line _____ shows the order of commands
3. In Step 7 of problem solving, you must _____ what you have done
6. In Step 3 of problem solving, you _____ the best solution
7. Remark statement
8. Before you can solve a problem, you must _____ it
9. Using these allows you to change values without changing the program
10. This command tells the computer to stop and jump to another line
12. This type of charting is useful in organizing your ideas
15. This command clears the memory
16. Command used to make a hard copy of your information
18. Flow charting helps you _____ your ideas
19. Beginner's All-purpose Symbolic Instruction Code





Session II

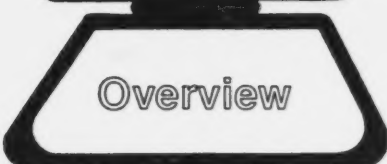
Entry Log

40

SETH



Session III



Overview

Doing Math on a Computer

While no one would buy a computer to take the place of a calculator, a computer does have a tremendous capacity to make complicated mathematical processes easy to execute. In this session we will investigate the potential of the computer to perform mathematical computations and, at the same time, review the rules for performing calculations on the computer. Specifically, during this session you will:

- become more comfortable working with the computer
- learn how to translate math sentences so the computer can understand them
- learn about the order of operations
- learn when to use parentheses
- practice using estimating skills
- practice using problem-solving skills

Session III

Info Sheet

How To Get the Computer To Do Your Calculating

In order to use the computer to do mathematical computations you need to be familiar with what keys perform which functions as well as the rules for performing computations.

Mathematical Functions on the Computer

Below are some of the common math functions and the computer keys which tell the computer to perform them:

add	+
subtract	-
multiply	*
divide	/
equal	=
exponent*	^ , ** or
greater than	>
less than	<

Find these keys on your computer keyboard and practice using them.

Rules for Performing Computations

Just as grammar rules provide guidelines for writing, the rules regarding order of operations provide guidelines for working with math statements. These rules are particularly important when you have a problem with more than one operation. For example, $4 + 5 \times 6 = ?$ Which do you do first; add the 4 and the 5 or multiply the 5 and the 6? You may wish to try it on paper and then give the computer the problem. Does your answer agree with the computer? If your answer and that of the computer do not agree, the following rules will help clarify why.

Order of Operations — The order of operations tells the computer which operation to perform first. In general this rule is:

1. Exponentiation is the first operation the computer looks for.
2. Then it will multiply or divide in order of occurrence from left to right.
3. Finally, it will add or subtract in order of occurrence from left to right. The order of operations is sometimes referred to as the "math hierarchy."
4. While most computers follow this order of operations, many spreadsheets do not. Therefore, it is necessary to learn how the computers will handle the math before you use a program.

*An exponent is a number used to indicate how many times that number is multiplied by itself. Thus, 16 is also 4^2 or 4 with an exponent of 2, sometimes referred to as 4 to the 2nd power. Exponents are often used to express very large or very small numbers as in 1,000,000 or $1 \text{ E } + 6$.

**Some software programs do not use this hierarchy. Try out several math sentences to see how your program solves them.

Using Parentheses — Sometimes you want the computer to follow an order different from that listed above. Using parentheses can make this possible. The computer will perform the operations in parentheses before following the regular order of operations. If you have any doubts about the order of operations, go ahead and use parentheses around those operations you want done first. Be sure to always have both a left and a right parenthesis. When more than one set of parentheses is involved in a problem, the computer will work with the innermost set first. In summary, the rules regarding the order of operations are:**

1. Parentheses, working from the innermost first, and then left to right.
2. Exponentiation, working left to right.
3. Multiply or divide also working left to right.
4. Add or subtract again working left to right.

The computer has the capacity to perform incredibly complex calculations, but the answer will only be correct if the computer receives the right information. Understanding the order of operations is essential to providing the computer with correct information.

The Importance of Estimating Your Answers — While the computer can relieve us of the burden of doing long calculations, this doesn't mean the user has no role to play. The user must estimate the answer so he/she can be reasonably sure there has been no error in how the computer received the information. Use the worksheet to practice estimating skills.

Estimation Strategies

This chart lists several approaches to estimating answers. You will likely be more comfortable with some than with others, but try them all at least once. This chart was developed by P. R. Trafton, NSF Estimation Project.

	Rounding	Front-End	Compatible Numbers	Other
Addition	$\begin{array}{r} 247 \\ 389 \\ +124 \\ \hline ? \end{array}$ $\begin{array}{r} 200 \\ 400 \\ +100 \\ \hline 700 \end{array}$ Estimate	$\begin{array}{r} 247 \\ 389 \\ +124 \\ \hline \end{array}$ (1) $200 + 300 + 100 = 600$ (2) over 100 about 150 (3) 750 Estimate	$\begin{array}{r} 46 \\ 18 \\ 56 \\ 83 \\ +40 \\ \hline ? \end{array}$ 100 100 40 240 Estimate	Averaging $\begin{array}{r} 289 \\ 342 \\ 319 \\ 276 \\ +304 \\ \hline ? \end{array}$ $5 \times 300 = 1,500$ Estimate
Subtraction	$\begin{array}{r} 8,245 \\ -2,639 \\ \hline ? \end{array}$ $\begin{array}{r} 8,000 \\ -3,000 \\ \hline 5,000 \end{array}$ Estimate	$\begin{array}{r} 8,246 \\ -2,639 \\ \hline ? \end{array}$ (1) $8,000 - 2,000 = 6,000$ (2) Under 6,000 (3) 5,500 Estimate	$49,217 - 17,647$ Use 17 and 47 = difference of 30 Estimate: 30,000	/
Multiplication	$4 \times 269: 4 \times 300 = 1,200$ Estimate $38 \times 63: 40 \times 60 = 2,400$ Estimate	$4 \times 269:$ (1) $4 \times 200 = 800$ (2) $4 \times 70 = 280$ Estimate: 1,080	/	"Nice Numbers" $38 \times 97: 38 \times 100 = 3,800$ $468 \times 9: 468 \times 10 = 4,680$ $24 \times 49: 24 \times 100 = 2,400$ so $24 \times 50 = 1,200$
Division	$38 \overline{) 2,489}$ $40 \overline{) 2,500}$ 6 $\rightarrow$ 60 Estimate	$6 \overline{) 3,724}$ 6 $\rightarrow$ 600 Estimate Find 1st quotient digit	$32 \overline{) 613}$ $\rightarrow 31 \overline{) 62}^2$ $\rightarrow 30 \overline{) 60}^2$ $\rightarrow 32 \overline{) 64}^2$ Estimate: 20	Size of quotient $6 \overline{) 2,580} \rightarrow$ in the hundred (2-digits) $28 \overline{) 1,672} \rightarrow$ in the tens (2-digits)

Session III

Worksheet

1. Perform the following calculations on paper and then compare your answers to those the computer gives:

Problem	your answer	computer answer	spreadsheet answer
$2 + 3 * 4 =$	_____	_____	_____
$2 + 3 + 4 * 5 =$	_____	_____	_____
$2 * 3 + 4 * 5 - 6 =$	_____	_____	_____
$2 * 5 / 10 =$	_____	_____	_____
$12 / 3 * 2 - 4 =$	_____	_____	_____
$4 + 5 - 6 + 3 / 3 =$	_____	_____	_____
$8 - 5 * 6 / 2 =$	_____	_____	_____

2. Solve the following problems on paper and then on the computer and note how parentheses change the answer. Try to estimate your answer first.

$2 + 3 * 4 =$	_____	_____	_____
$(2 + 3) * 4 =$	_____	_____	_____
$12 - 3 * 2 + 6 - 2 * 4 =$	_____	_____	_____
$(12 - (3 * 2)) + 6 - 2 * 4 =$	_____	_____	_____

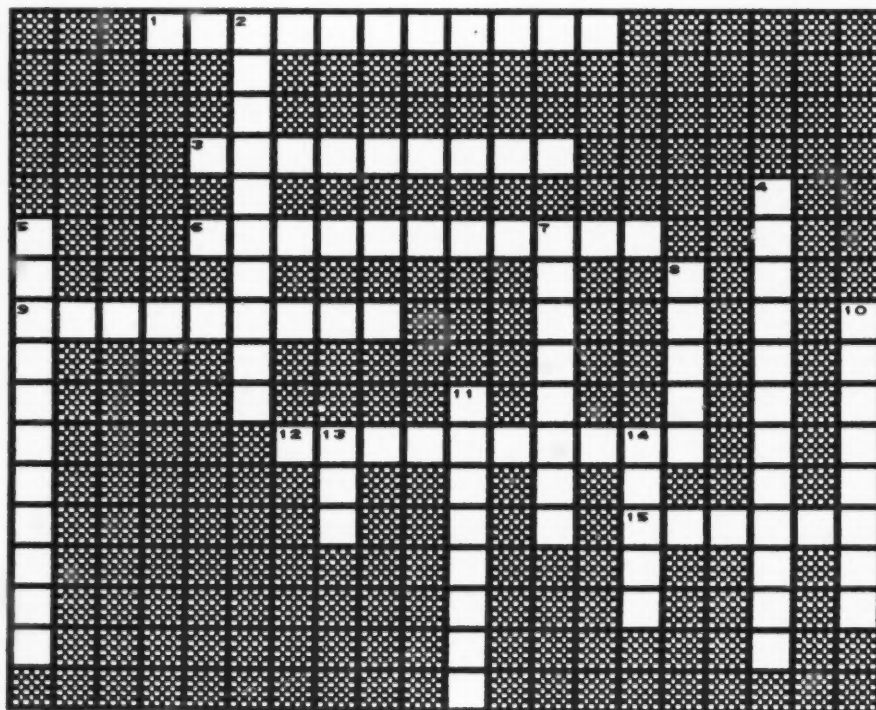
3. Write a program using several math operations, such as: miles/gallon + oil = car use cost.

Across Clues

1. > (two words)
3. Another term for order of operations is math _____
6. Use these to indicate operations to be done first
9. These (+, -, *, /) are called mathematical _____
12. We often use these to do mathematical calculations
15. "/"

Down Clues

2. You do this to check the computer's calculations
4. The computer has the capability to do very complex mathematical _____
5. General order of math operations (three words)
7. "-"
8. Another term for exponent
10. Indicates how many times the number is multiplied by itself
11. "*"
13. "+"
14. _____ of operations decides which operations are to be done first



			G	R	E	A	T	E	R	T	H	A	N				
			S														
			T														
			H	I	E	R	A	R	C	H	Y						
			M													C	
L			P	A	R	E	N	T	H	E	S	E	S		A		
E			T							U		P	L				
F			F	U	N	C	T	I	O	N	S		B		O	C	E
T			N							T		W	U	X			
T			G					M	R			E	L	P			
O			C	A	L	C	U	L	A	T	O	R		A	O		
R				D				L	C	R		T	N				
I				D				T	T			D	I	V	I	D	E
G								I				E		O	N		
H								P				R		N	T		
T								L						S			
								Y									

Session III

Entry Log

Session IV

Overview

Developing Programming Skills

In this session you will have an opportunity to apply not only programming and computational skills but also the problem-solving process from earlier sessions to writing your own program. One way to write a program is to sit down at the computer and begin typing in commands. Most experts agree, however, that this method often leads to serious problems in the program design. A more effective method, often referred to as "top down programming", requires planning your program on paper first. This method is like that of writing an outline for a letter or paper before beginning to actually write the text.

In a similar fashion programmers use a technique called flow charting to put the information into a sequence the computer can understand. Flow charts along with the top down programming approach allows programmers to outline their program before they begin to input commands on the computer. Although the techniques of flow charting and top down programming, like outlining, require some serious study to learn, becoming comfortable with these techniques will make programming a more enjoyable and useful skill for you. Therefore, in this session you will:

- discuss the history of computer development
- discuss the impact computers can have on people in Idaho
- break down a task into programmable steps,
- learn what a flow chart is,
- practice using the flow chart,
- learn what top down programming is,
- write a program using these techniques.

How the Computer Understands a Program

Just as you can learn to speak, read and write in many different languages, you can also communicate with your computer in several different languages. While most computers come with some form of BASIC in the ROM, many programs use other languages in the program. Your computer will not be able to understand these languages unless it has the information to turn that language into machine language or code. You may run into this problem when, for example, you load a program into the computer that requires Integer Basic, one form of basic used often on Apples. That program will not run until Integer Basic is loaded into the RAM. With the Apple, this can be done by using the DOS Master.

Similarly, many people prefer to program in a higher level language such as PASCAL, FORTRAN, COBOL or more recently C, but cannot do so unless they have the software that tells the machine what to do with the language. In addition, some machines require additional cards, often referred to as language cards, in the computer itself to work with these languages.

You may wonder how a machine that functions with electrical circuits can understand programming language. Basically it doesn't. One difference between the way we use language and communicating with a computer is that computers need an additional translator between the programming language and the actual interpretation of the information. This is because most machines use a binary system.

The binary system reflects the fact that electrical circuits only understand on/off. Some more powerful microprocessors use something called a hexadecimal system that is a system based on 16 instead of the more cumbersome binary system. Instead of bits, the hexadecimal system focuses on nibbles which are 4 bits. These four data elements can be arranged in 16 different ways. Hence, this is the rationale for such a system.

Built into the ROM, computers have a method of translating the computer language it comes with into something the machine can do. When another language is added, a new translator must be a part of the software. Translators are usually either interpreters or compilers, and their job is to translate the programming language into machine language or code so that the microprocessor can follow the instructions.

Developing Your Program Skills

As you begin to get comfortable with programming tasks, you will want to try some more complicated programs. The more complicated the program, the more important the method of organization you use. Since computers require precise instructions to understand the program, organization is extremely important. Without proper and logical organization, the computer will not be able to follow the instructions to perform the task the way you envisioned.

Programmers commonly use two complementary techniques for organizing their material so the computer can use it. One technique, flow charting, was briefly introduced in Session II. In this method, the direction or order of the program is emphasized. To use this method, you focus on how to give the computer precise directions for acting out a particular task. While this method is an important one, particularly for those of us who are not used to giving or following precise directions, it can lead to some problems. For example, the task by task approach may lead to complications when a given task can be repeated several times.

Another method, that of top down programming, is becoming more popular. With this method, before you think of the logical flow of directions, you break the larger task into little tasks. These smaller parts of the whole can usually be broken into three types of tasks or program blocks, action, loop and

branch blocks. With the top down approach, each action is separately coded into a subroutine. These subroutines can be run by themselves. In this way, you test all the little pieces to see that they work before trying to run the whole thing. Both repeating the same task as well, troubleshooting and DE-BUGGING activities are likely to be much less frustrating.

More detailed information on top down programming is included in the Appendix. We urge you to review this material and think about your own problem-solving style. You may end up working with a combination of both techniques, or you may have your own technique. The important point is that computers require communication to be organized logically, and in order to be successful in communicating with them, you must develop a method for organizing your communication.

Session IV

Info Sheet

Storing and Changing Values in a Program

As you work on developing your skills, you will want to take on more and more complicated tasks. To do so, you must learn to translate those tasks into something the computer can work with and at the same time keep command of the programming process. Knowing how the computer stores and then changes values will aid you in inputting information in such a way that the computer can process it effectively.

When the computer receives a value for a variable, it stores that value at a specific address in its memory. Many programs, however, require that the value stored in that address be changed. The method of instructing the computer to make this change often creates confusion for the beginning programmer. For example, look at what happens to this program for printing the odd numbers between 1 and 99, by Author Luerhrmann (Creative Computer, June 1984):

```
10 LET C = 1
20 REM LOOP
30 IF C > 99 THEN 70
40 PRINT C
50 LET C = C + 2
60 GOTO 30
70 REM LOOP ENDED
```

In LINE 10, C has the value of 1, but in LINE 50, C first takes on the value of 3, then 5 then 7, etc. For many people, this is a confusing concept. Based on what most people learned in algebra, it seems impossible for C to be first one thing and then another.

Kyra Rolstad, the READI peer teacher from Weippe, has used an egg carton to explain what the computer is really doing. Imagine that the egg carton is where the computer stores information. In LINE 10 we asked the computer to label one space in the egg carton as C and to put in that space the value 1. Later in LINE 50, we asked the computer to remove the old value and to replace it with a new value, 3. LINE 60 instructs the computer to continue replacing the value until it has reached 99. The Apple tutorial on BASIC uses mail boxes to illustrate the same point.

In this example, (C = 1) is not a permanent value for C, but one number of possible values stored in a specific location in the computer's memory known as C. Practice using this method by writing several different short programs.

Session IV

Worksheet

Pick an everyday task that you do often such as balancing a checkbook, figuring how many miles per gallon you get per tank of gas, figuring the sales tax on an item or organizing a list or plan.

1. How would you break the entire task down into subroutines?

2. Use the flow chart symbols in this session to write a flow chart of the activity. _____

3. How would you transform the flow chart steps and subroutines into programming commands?

4. For more practice, get a copy of a computer magazine or book with listings of programs and try entering and running them. In many cases, once you have entered the program, you will also want to try running it.

Brief Historical Review of Computers

Computers are a recent step in a long history of people trying to sort, use and store information. Advances in manipulating information have accompanied increases in both the complexity of information — equations, for example, and the volume of information — such as that found in libraries. Some of the key historical junctures toward the development of computers are:

- Early storytelling mechanisms such as paintings and beads.
- Early counting mechanisms such as fingers and pebbles (indeed, calculus is a Latin word meaning small stone or pebble).
- Both written language and a simple numerical system were necessary forerunners to keeping and using information in large quantities.
- As tasks involved in counting became more complex, the abacus was invented around 3,000 to 5,000 years ago.
- In the 16th century, a Scotsman named John Napier developed a device for multiplying. "Napier's bones" was the forerunner of the slide rule.
- In 1622 the slide rule was invented.
- As books became more popular, the printing press was developed.
- Centuries after the abacus, Blaise Pascal invented an "arithmetic machine." He designed this machine in 1642 to aid in his father's tax collections. It had eight wheels connected together with gears to enable a person to add and subtract by dialing the amounts. Today we associate Pascal with a high level computer language. The odometers in cars are an updated version of Pascal's calculator.
- Leibniz advocated the use of binary numbers, but binary numbers were the discovery of very early people who counted "one, two, two and one, two and two, two and two and one . . ."
- In 1671, Gottfried Leibniz designed the "Stepped Reckoner" which could not only add and subtract, but also multiply, divide and do square roots.
- In the early 1800s, Joseph Jacquard developed an automatic weaving loom using punch cards. This invention was based on the automated organ developed several years earlier. The loom was destroyed by angry workers who were afraid of losing their jobs.
- In 1835, English inventor Charles Babbage attempted to develop the "analytical machine," but was unable to manufacture workable parts. He is often referred to as the "father of computers." (Ada Lovelace helped program the device and became known as the "first programmer", 1845.)
- In 1868 the typewriter was invented.
- In 1876 the telephone was invented.
- The Patterson Brothers invented the cash register in 1883.
- In 1889, Hollerith developed the first electrically driven computer, designed to help with the 1890 census. The company he founded later became IBM.
- In 1927 the first electronic signal was transmitted.

- The first large analogy computer was built by Vannevar Bush of MIT in 1931.
- In 1939, IBM and Harvard University collaborated on the Mark I. It was 50 feet long and 8 feet high — the world's largest adding machine.
- Colossus was designed in 1941 as the first electronic computer.
- Van Newman invented the stored program concept in 1945.
- In 1946, ENIAC was built at the University of Pennsylvania. This huge computer contained 18,000 vacuum tubes. It took up 3,000 square feet and weighed 30 tons. One tube failed every 7 minutes.
- In 1947 transistors were invented to replace vacuum tubes.
- In 1951, UNIVAC was developed as the first digital computer for commercial use. Its first customer was the U.S. Census Bureau.
- In 1954 the first fully transistorized computer was built.
- FORTRAN was developed in 1957.
- Grace Hopper spearheaded the development of COBOL and successfully used her original computer in 1959.
- In the 1960s, transistors were developed to replace the tubes with silicon chips.
- In 1969 microprocessors were developed.
- In 1970 integrated circuits were designed to reduce size.
- In 1971, the first programmable microprocessor was developed, successfully combining all the elements of conventional computers.
- In 1975 the first minicomputer was produced.
- In 1975, the microcomputer was first introduced as a kit for hobbyists and the first computer store opened.
- In 1977 the personal computer was first preassembled for sale.
- In 1982 3 million microcomputers were sold.
- In 1982 Commodore 64 went on sale and so did Lotus 123.
- In 1983 the IBM PC Jr was announced.
- In 1984, Apple sold 2 million Apple IIs.
- In 1984, there were an estimated 7.5 million computer owners, 200 micro companies and 111 surviving computer magazines.
- In 1985, 25% of the population used the computer as a primary work tool.

For more information, see *The Personal Computer Book* by Peter A. McWilliams and *Computers in the Classroom* by Rodin and Lee, *The Last Half Decade*, Info Worlds, Feb. 18, 1985, and *Computer-Related Historical Landmarks*, EQUALS, University of California, Berkeley, 1985.

Effect of Technology: The Two-edged Sword

Technology in and of itself is neither good nor bad. The outcomes of technological innovation and application depend on the circumstances to which it is adapted, the goals of the user and the people it affects. But, while technology is neither positive nor negative, it is not passive. It cannot be ignored on the assumption it will go away. Therefore, the introduction of computers into the Idaho countryside can be a force for positive change or for negative change. Let's look at several of the positive and negative possibilities of technological change.

Job Loss and Job Creation

Of course one of the most discussed issues in relation to technological development is unemployment. Experts estimate that over the next decade, the application of new technology will result in the elimination of 5 to 7 million blue collar jobs and 7 to 12 million white collar jobs. At the same time, high tech advancements will create only 7 to 10 million jobs. Furthermore, the remaining 5 to 13 million technologically displaced workers will be joined by an estimated 7 to 10 million workers who are predicted to lose their jobs to foreign competition. Even now prison guards, clerks, grocery store employees, factory workers and teachers are being replaced by machines.

An example of how technology can create displacement can be found at the Bank of America. High tech innovations have made it possible for this bank to close 120 branches and reduce its work force by at least 3,000 employees.

While jobs in large industries are declining, self employment is booming, reversing a long trend of decline. New opportunities in self employment are increasing as some aspects of the economy respond to both local initiatives and opportunities to invest in technological innovation. Some observers, however, are also concerned with the kinds of jobs that have resulted from these trends.

For example, computers make it possible for people to work out of their homes. This could mean that people would be able to work in an environment of their choice and perhaps more easily merge family and work life. It could also mean a return to the sweatshop system of production. Such a system was responsible for many of the horrors found during the early period of the industrial development. Indeed, people often worked 18 hours a day for a mere pittance. Wages were so low that everyone who was able worked every minute they could, often leaving child care to the winds of chance.

The "electronic cottage," as it has been dubbed, could go either way. Because women and children were most often victims of the previous "putting out system" (taking work home), unions with large numbers of women members and many women's groups are carefully monitoring this development of electronic cottages.

High Tech and High Touch

The replacement of many people by electronic devices has led to concern for the increasing dehumanization of our world. Many people do not like interacting with machines; we value seeing and talking to other people. While the negative potential for living in a world in which everyone is isolated from others has been discussed many times, the positive potential of freeing our time from everyday duties in order to have quality time with those we care about can be an important factor in the future.

The tension between high tech and high touch potentials is nowhere more apparent than in the "touch" industries, particularly health care and education. Indeed, some experts predict that education will be-

come the largest industry in the U.S. as the demand for retraining and educational programs increases with technological displacement.

Health care and medicine also figure prominently in the present and future hierarchy of economic enterprises. Where these endeavors occupy so much of the national GNP, they not only affect individuals but also the quality of life in general. Technology that dehumanizes the patient or student by treating them as an object is already on the horizon, but so, also, are new ideas and methods for utilizing the advances in technology to improve delivery of services and increase each person's opportunities to choose for themselves what is best.

Community and Big Brother

Advances in information technology can increase the ability of government and industry to monitor each person. It can also function to increase each person's ability to access resources. Thus, on the one hand, there is a possibility of a future where the centralization of information increases centralized control and potentially leads to the Big Brother state. But, on the other hand, information technology can make it possible for everyone to access any data bank for information, thus resulting in a diffusion of information as opposed to the centralization of information. A potential outcome of the trend toward diffusion is that individuals in small, remote communities could learn anything they wanted to, communicate with a wide variety of people and institutions from all over, and do shopping, financial transactions, bill paying, etc., directly.

Of great concern to many people is the effect all these new technologies will have on each person's privacy. Even now, people with whom you have had no contact can examine your credit rating and learn many private details about your life. Since access to privacy, as well as access to information, are both key concepts for a democratic and humane society, how information technology is applied will affect the nature of our political system and the possibility of living in a free and just society.

Individual and Community Choice

The changes in technology are most apparent in the transformation of our economy. Heavy manufacturing companies and other industries in the country have moved many of their operations overseas, leaving many people jobless and many communities dying. Furthermore, those high tech industries that are creating jobs are not locating in areas with high unemployment.

While individuals face serious threats to their own and their families' futures, the same can be said of many communities. In both cases, the decision that has resulted in such suffering was made elsewhere with little concern for either individual workers or specific communities. In response, people in many communities have banded together to work out a program for economic development that will not leave them subject to arbitrary decisions and that can provide jobs for local citizens. A key element in many plans is the decision to support and develop local small businesses and cooperatives.

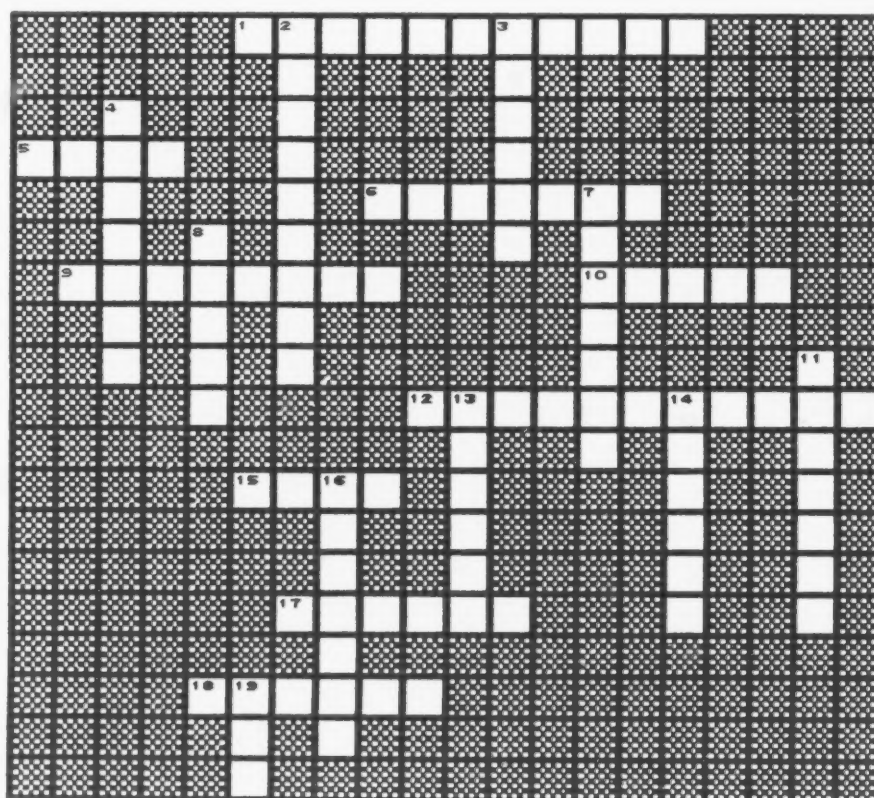
These examples instruct us in ways to influence high tech trends to benefit both ourselves and our communities. In both cases we must plan carefully in order to actively direct the future. One key element in planning for the future revolves around concerns for equity. Equity issues are crucial because they address the questions of who has control and who makes the decisions. Thus, in the broadest sense, the issue of equity challenges planners to provide equal access to decision-making tools and to the information necessary to make good decisions for all people, regardless of race, gender, age, geographic location, religion, lifestyle, class background or physical abilities. Clearly, where equity concerns are not part of the program, technology will become a tool of the elite and its application will continue to deepen the divisions in society. Conversely, the potential for enhancing democratic participation in this society will be, in large part, a reflection of the role that equity issues play in the introduction of technology, particularly in relation to computers. Where access is equalized, technology can make a significant contribution to the building of a better society for us all.

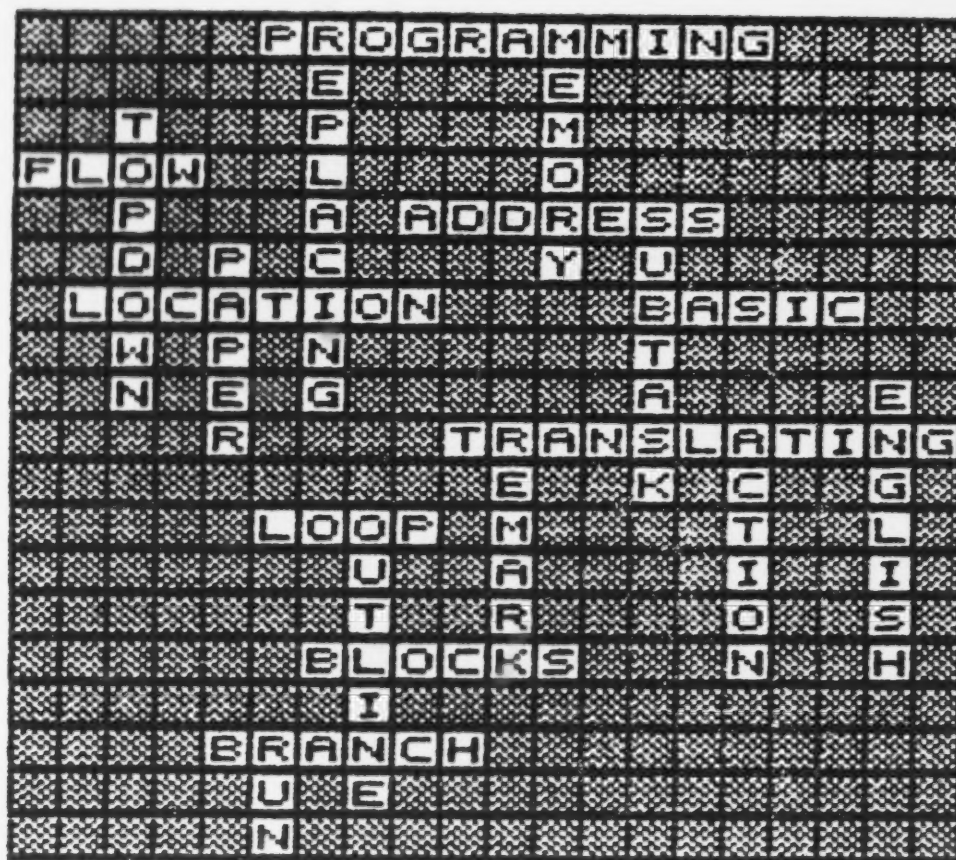
Across Clues

1. The process of giving instructions to a computer
5. This type of chart helps in organizing your ideas
6. While programming you are able to select a specific _____ within the memory
9. Common term used in place of specific address
10. Common computer language
12. In Step 3 of top down programming, _____ your English phrases into BASIC is required
15. You would use this type of block to do counting
17. Each represents one activity
18. This block is used when there are different options depending on input

Down Clues

2. Let $C = C + 2$, calls for the _____ of an old value with a new value
3. Used to store information and data
4. A way of programming that helps you organize ideas (two words)
7. Part of a larger task
8. The first step to programming is to organize your thoughts on _____
11. You first write task commands in _____, then translate to BASIC
13. REM statement
14. Block that gives a straight sequence of action statements
16. A general series of blocks without much detail
19. Command to start program



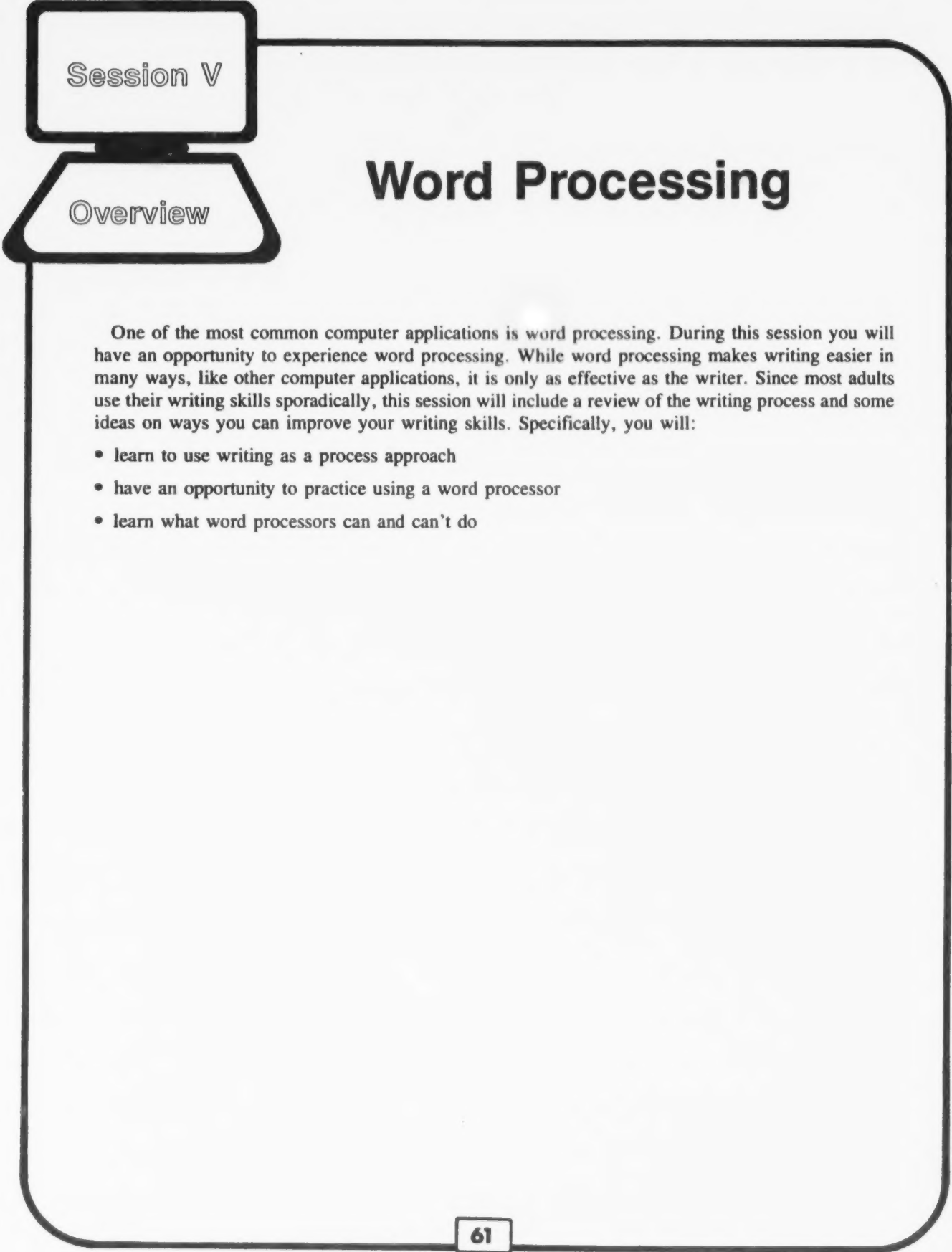


Session IV

Entry Log

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Session V

Overview

Word Processing

One of the most common computer applications is word processing. During this session you will have an opportunity to experience word processing. While word processing makes writing easier in many ways, like other computer applications, it is only as effective as the writer. Since most adults use their writing skills sporadically, this session will include a review of the writing process and some ideas on ways you can improve your writing skills. Specifically, you will:

- learn to use writing as a process approach
- have an opportunity to practice using a word processor
- learn what word processors can and can't do

Introduction to Word Processing

Most of us are familiar with the typewriter. Typewriters allow us to store information on hard copy. To do so we often go through two tasks: entering the information and then, more often than not, correcting that information via a self-correcting key, white-out or the old familiar eraser. Then, when we have finished typing and correcting, we have a piece of paper on which the information is stored.

While word processors can do the same tasks, they also do much more. Not only can you enter information with a word processor, you can also create information with what some people call fingertip thinking. In fingertip thinking, your intellectual abilities, feelings and values combine with the computer's speed in processing to create a whole new environment for both thinking and writing. Not only do you correct errors, you can also rewrite, redesign and do major editing with just a few simple keys. Not only do you get a hard copy, but you also have more control over the format the printer produces.

Let's look at some of the functions that make word processors so much more useful than typewriters.

Entering and Composing on the Computer

Entering information with a word processor is similar to a typewriter in that you use the keyboard to type in words and characters. Unlike the typewriter, however, with a word processor you have more control because of the CURSOR. You can move it easily to any part of the screen you desire.

Correcting Errors — In addition to having more control over the cursor, you also have several options for correcting mistakes. Word processors give you a means to INSERT missing words, letters, phrases or even paragraphs. You also have a key that DELETES data. Some programs also have control keys that allow you to delete whole sections. In addition to delete and insert functions, you also have the ability to OVERSTRIKE existing information with new material. These word processing functions take much of the drudgery out of editing your writing.

Other Editing Opportunities — In addition to inserting or deleting text, word processors usually provide you with several more important functions. For example, you can use the FIND or SEARCH/REPLACE functions to change all the spellings of a word you consistently misspell, or even replace it with a different word or phrase instead. You can use the MOVE function to rearrange blocks of text to try out different ways of organizing information. Using these functions, you can experiment with writing more comfortably and easily.

Storing and Formatting Your Copy

Unlike typewriters, computers give you opportunity to store your information to hard copy with a printer or to a disk so you can work on it later. Word processors also give you more control over what the copy will look like. You can use the machine to set MARGINS, INDENT, change PRINT SIZE, etc. With word processing, you can be creative in your writing as well as in the way you present it.

Conclusion

While computers do not have judgment, creative ability or values, they do have the ability to process information quickly. Word processing machines provide an opportunity for your skills to merge with the computer to advance beyond previous boundaries or, as they say in Star Trek, "to go where no one has gone before." In this sense, word processors are not just an electronic typewriter. They can also free many of us from our barriers to writing and allow us to be both more creative and more expressive. Building on the word processor's ability to stimulate thinking as well as creativity by easily translating thought into writing, many commercial houses are coming out with idea processors that include several additional factors beyond those typical of word processors.

Session V

Info Sheet

Writing as a Process*

The best way to learn to write is to write. That may seem obvious, yet in school, many of us have been taught grammar, punctuation, spelling and other mechanical considerations of language. These have been called "writing" or "composition" classes. As a result, many of us hate the idea of writing and find the hardest part of writing is sitting down and doing it. You try to remember all the rules. You try to ignore the knot in your stomach, and you try to get the writing done as soon as possible. Rarely do those of us who fear writing enjoy doing it.

The READI Project staff believes that writing can be fun and exciting. We also believe that writing is much more than punctuation and grammar. Writing is discovery, and each time we sit down to write, we discover old ideas we'd forgotten and new ideas we've created. This section of the manual is designed to help you with your writing and with learning to enjoy doing it.

The discovery process happens inevitably when we write, but it happens more consistently, and perhaps with greater impact, if we can rid ourselves of the fear of writing, if we write regularly and if we allow ourselves the freedom of writing and thinking spontaneously. In order to help you write freely and spontaneously, we'd like to describe what happens when someone writes. We see writing as a three-stage process: prewriting, drafting and revision. Prewriting is usually thought of as the discovery or creative stage, but discovery takes place in all three stages. In this first stage, the writer thinks about a topic.

Thinking about your topic includes discovering what it is. Sometimes you might not even know that you are going to write anything. You could be taking a shower, at a wedding or digging in the garden when an idea comes to you. You might even talk to someone else or jot down a few notes. At another time, with another topic, you find an idea coming from a book you're reading or from an assignment you're given by the local historical society. You might think about your idea by going to the library or interviewing an aunt. You might also think about your topic by writing in your journal.

Whatever you do that helps you think about or discover your topic is prewriting. You may already be aware of these first creative steps toward writing without ever having named them. Writing experts call this first stage of writing "prewriting." Prewriting is important because it allows time for letting your ideas spontaneously grow and organize themselves. It allows you to discover what you do and do not know.

Only after careful thought, after gathering together what you know about your topic, can you sit down and begin to write. This second stage of the writing process, called drafting, pays more attention to the form your written composition requires. As you write, moving from the prewriting stage to the drafting stage, your attention shifts. Whereas in prewriting, you are primarily concerned with generating the ideas, in the drafting stage you are concerned with form and audience as well as content. As you work on your draft, you consider the form and arrangement best suited for your purpose.

Discovery of what you know and do not know continues in this stage. As you reread your first draft, you may discover that you have omitted some important information. You may even need to do some additional reading, interviewing or thinking. In looking at the form your piece has taken, you may discover that you need to add a transition paragraph between two major ideas. Sometimes you will reorder your

*Adapted from the *Effective Writing Manual* of the New Dimension Project.

paragraphs, placing what you originally conceived of as an introduction at the end. What you had in the middle may be reversed or placed at the beginning. After such major reordering, additional transitions will most likely be needed. In this way, your writing grows and changes. If you allow yourself to write freely, this second drafting stage of writing can be as full of discovery and creativity as the prewriting stage.

Between stages, and even during them, it is valuable to put your writing aside for awhile. Separating yourself from your work provides distance and allows you to see it with a new perspective. Doing this at each stage of your writing process should be an integral part of your composing process.

Stage three of the writing process, revision, concerns the writing style, word choices, variety of sentence structure, grammar, spelling, punctuation and tone. Thinking of these style issues in earlier stages often handicaps thinking and discovery, and it can cause you to sacrifice your spontaneity in favor of smooth prose, limiting your creativity and restricting your productivity. It is only in the revision stage that you begin to edit what you have written. Some writing teachers believe that editing should not occur before this stage.

We encourage you to share your writing during each stage of the composing process. Getting together with other writers and taking feedback from them will help you mature as a writer. It is especially valuable in the drafting and revisor stages of composing.

Ideas for Creative Writing*

New Point Questions — The following questions ask the learner to see things from a different point of view — to be flexible in his/her thinking. Below are some samples applied to different content areas:

- How would you feel if you were the pendulum in Poe's *Pit and the Pendulum*?
- How would you feel if you were the inside of a strawberry?
- How would you feel . . .
 - if you had just stepped out onto the moon's surface?
 - if you were lost in the Rocky Mountains with only a canteen of water and a box of crackers?
- Write 3 stories about an accident from the points of view of the victim, the perpetrator, and an observer.

Reality Questions — The following takes "fact" and reorganizes it. It takes the real world as we accept it and asks the mind to change it around and then think about all the things that might happen if things had been or really are existing in the new way:

- What would happen if we had no names for colors?
- What would happen if the color red disappeared when you left home today?
- Suppose right and wrong were reversed. What are all the things that might happen?

Analog Questions — The following questions ask the learner to think by analogy — a basic creative thinking process, also called associative thinking. It asks you to make comparisons between things that are dissimilar. Some examples of this kind of question in different content areas are:

- How is the discovery of North America like landing on the moon?
- How is long division like baking a cake?
- How is an automobile like a gun?....an airplane?....a friend?
- How is money like a thief?

*Adapted from *New Dimensions*.

Personal Questions— The following questions ask the learner to write about him/herself.

- What makes an event “significant”?
 - to us at the time/later.
 - to our families/friends.
 - to our own society/world society.
- What made you decide what kind of person you are? Was it a few particular events or a gradual process? (What kind of person are you?)
- What determined the job you have? Place you live? Was it a choice or an event? Chance?
- What are your strongest beliefs or convictions? Was there an event or series of events leading to this?
- What about your aversions, pet peeves?....your dreams/desires?....your strengths, capabilities, skills?....(Why should you have trouble with this one?)

MSU Writing Project — Writing Process*

Discovery

Design

Style

Pre-writing → production of first → shaping draft → redraft → redraft → edit → final copy
scrambled draft

thinking
brainstorming
free writing
puzzling
questioning
using a set of
teaching
techniques
reading
research and note
taking
journal writing

further discovery of
ideas through writing

settling on “thesis
statement”
develop precise goals for
written article
decide on audience
arrangement of paragraphs
outlining
development and
coherence of paragraphs
transitions

gracefulness
variety of sentence structures
focus and coherence of
sentences
grammar
usage
punctuation
spelling
manuscript tone

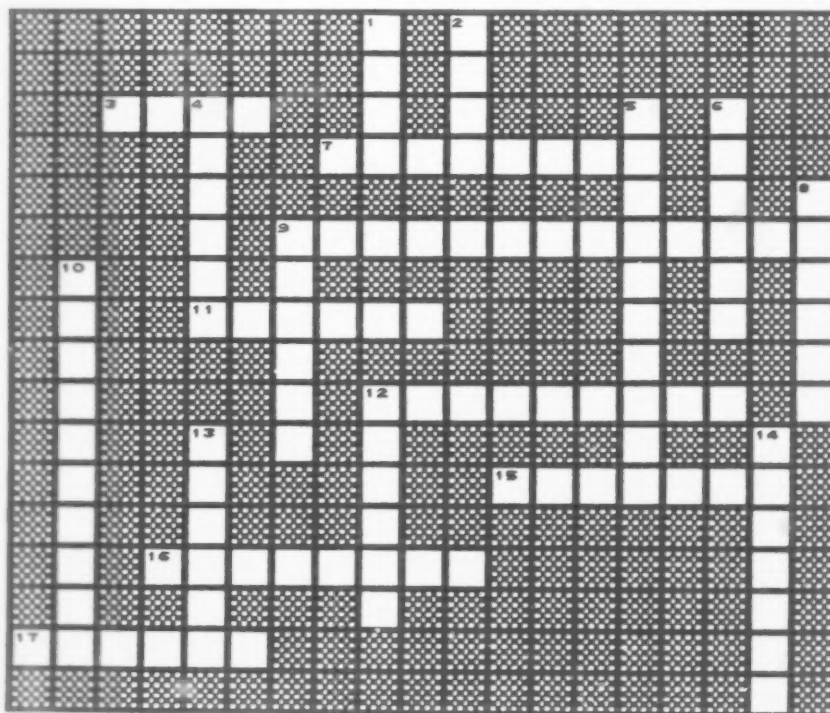
*Developed by the Montana State University Writing Project, Bozeman.

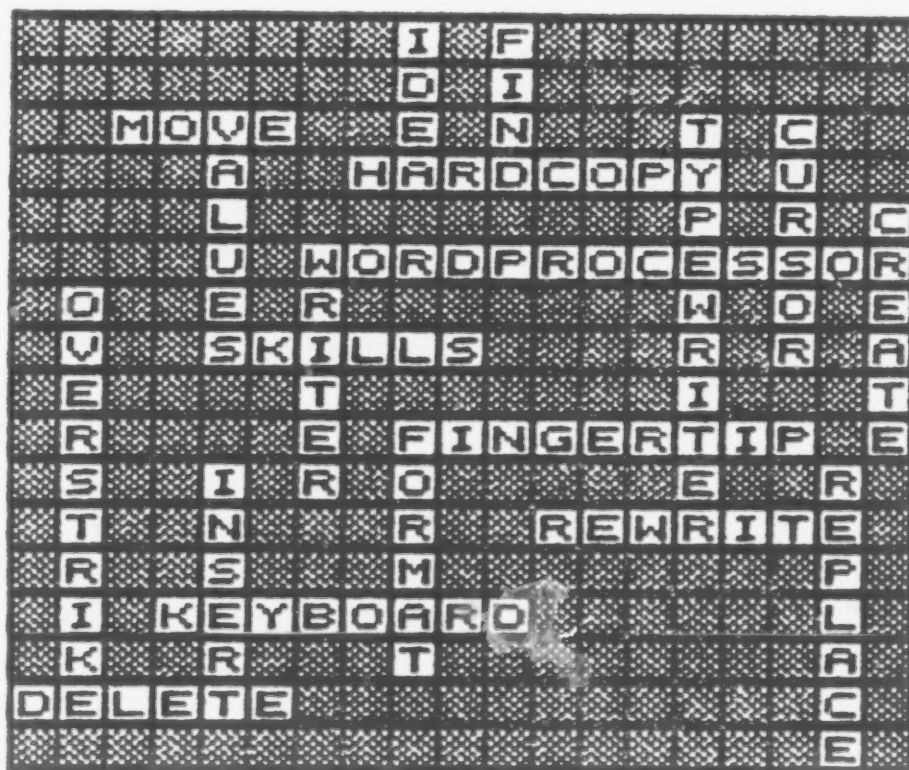
Across Clues

3. This command allows you to arrange blocks of text
6. Shows location of next character
7. Another term for printout (two words)
9. A program that allows you to write an edit text
11. Writing _____ is important to our daily functioning.
12. A type of thinking process unique to the use of word processors
15. Second step in the writing process
16. Main device for inputting data when using a word processor
17. This key allows you to erase errors

Down Clues

1. The _____ processor has several added features that the word processor does not
2. Command used to locate certain words or phrases
4. Your _____ and feelings are an important part of writing
5. The old fashioned way of processing text
6. Shows location of next character
8. The ease of rewriting allows you to _____ a whole new environment
9. A word processor is only as effective as the _____
10. Command used to type over the top of old text
12. Series of commands that determines setup of the print on the page
13. Allows you to add missing letters or words into the text
14. Search/ _____ command allows you to change the spelling of a word throughout the entire document





Session V

Entry Log

Session VI

Overview

Writing with a Word Processor

Using a word processing program to work on a piece of writing is more than a one-step process for several reasons. Becoming proficient with the program takes practice. And, writing itself includes several stages.

As we discussed in Session I, effective writing usually involves several different stages and often requires some thoughtful reflection. For example, most people make use of several different prewriting activities over a space of time before they begin the actual design of the piece. Similarly, in designing the writing, an individual may again work on it over a period of time. Finally, in the editing stage of writing, many people rely on the input of others to help them clarify the meaning of the piece.

This session is designed to provide you with an opportunity to increase your skills in using a word processor and, at the same time, enhance your writing skills, not only through practice, but also by participating in a group editing process. In addition to working with the word processor and improving your writing skills, this session will also focus briefly on the idea of software evaluation.

As you encounter more and more software programs, you will notice a wide range in the quality and usefulness. Developing criteria for evaluating these programs will help you make the best possible use of software programs and provide you with practice in using your evaluation skills.

Specifically, in this session you will:

- learn about and use the group editing process,
- practice using the word processor by working on a piece of writing,
- discuss what makes a piece of software best for you
- practice evaluating software programs.

Editing Groups

Editing is perhaps one of the hardest writing skills for people to learn. In the last several years, numerous projects have worked with a new approach to teaching editing and revision skills. This approach revolves around the

use of small groups where members of the small group act as co-editors. Many of the exercises and discussion sessions described in this manual are based on this approach.

Since many people are reluctant to share their writing with others, we need to begin with some non-threatening activities that help small groups get to know each other and build an atmosphere of trust. Once the group members are comfortable with each other, they can begin to share their writing. Part of the first meeting should be an exercise that allows an effective way for the group to set guidelines for itself.

The purpose of the editing group is to give the person feedback on the effectiveness of his/her writing. Rather than teaching people about topic sentences, thesis and themes, we suggest that people write and then share their writing with others. The editing group can use the editing checklist to guide in giving effective and appropriate feedback to each other. This approach focuses on actual communication rather than on learning the rules that facilitate the communications. We have found that learning by doing, rather than by memorizing rules, is far more effective for most adult learners.

The final piece may have some elements in it that still confuse one or two members of the group, but for it to make sense to others, it must be fairly well organized and grammatically correct. Participation in the small group will sharpen everyone's editing skills.

Session VI

Info Sheet

Writer: _____

Editor: _____

Editing Checklist*

Read the first paragraph only.

1. What is the title of the paper? _____
2. What is this paper going to be about? _____
3. **UNDERLINE** the phrases or sentences which indicate topic of the paper.
4. If the opening paragraph doesn't have a sentence that tells what the subject is, write one for it.
5. After reading the opening paragraph, are you interested enough to keep reading the rest of the paper? Yes ☐ No ☐
SUGGEST ways the writer could add to the effectiveness of the opening paragraph.

Read the rest of the paper.

6. Will the reader stay interested? Do you have a vivid example, a "snapshot" in words to illustrate your subject?
7. Does the essay make use of: questions, interesting details, examples, description, narrative, anecdote, startling or unusual facts, statistics, quotations, analogy? **CIRCLE** any of the above which are included.
8. Are all the writer's generalizations supported with adequate evidence — facts, statistics, relevant examples, etc.? _____

Does the writer state "truths" and simply expect readers to agree? **PUT BRACKETS []** around every generalization which needs more evidence.

9. Does all the writer's evidence, information and detail relate directly to the issue? _____

*Adapted from New Dimensions

10. Are there any words, phrases or details included that you don't understand? PUT THEM IN BRACKETS [].

11. Read each sentence as a separate unit, blocking the rest with your hands. Does it make sense all by itself? Rewrite any that don't stand alone.

12. Is the body of the paper arranged according to some orderly plan? _____

What is the plan — the arrangement of the essay (cause/effect, chronological, general to specific, etc.)?

Are the steps of that plan easy to follow? Yes ☐ No ☐ Why or why not? _____

13. Does the paper flow smoothly? Yes ☐ No ☐ Are there transitions between sentences? Yes ☐ No ☐ between paragraphs? Yes ☐ No ☐ WRITE a "T" wherever a transition is needed.

14. What kind of audience did the writer intend this for (group members, professors in own field of study, writing teachers, etc.)? _____

How can you tell (language, explanations, etc.)? _____

Session VI

Entry Log

Session VII

Overview

Computer Applications

During the past six sessions you have had an opportunity to learn about how the computer works and how computer power can be applied to computations and writing. At the same time, you have been exposed to several different software programs. During the panel discussion in this session you will have the chance to listen to others talk about how they are actually using a computer. You also will have the opportunity to ask questions about their experiences, both good and bad, in applying computer power to real life situations. Thus, this session has been designed to:

- introduce you to a variety of computer applications and software programs,
- provide you with an opportunity to ask others about their experiences working with computers,
- include some additional practice time.

Software

One way to think of a complete computer system is to see it as having three parts: the hardware, the software and the user. Earlier in this class we worked with the hardware, and in the process of introducing you to that hardware we made use of several software programs. Software can be the most crucial part of your system because it provides the interface between the hardware and you, the user. Indeed, many experts recommend that people interested in purchasing a computer begin with the software. That is, first you must know what you want the computer to do and what software will provide you with that capability. The next step is to find the hardware that works best with those software packages. The final step is learning to work with the system by using the software to achieve your goals.

A software package is actually made up of two components. It is a collection of programming commands that instructs the computer to carry out a specific task. Such programs can be written in many different programming languages, which vary from very complex to extraordinarily simple. In purchasing a software package, the user avoids the work of programming the computer to carry out the task.

A software package also includes written information explaining how the program works the documentation. Some of the more simple software packages are self-documented, that is, the information on how to use it is built into the program. Most programs are accompanied by a pamphlet or notebook with instructions. The quality of these instructions can make the difference between an easily accessed program and one that makes the user want to tear his/her hair out. Both components, the program and the documentation, should be included in an evaluation of a software package.

Because so much software is being produced at such a rapid rate, software evaluation is becoming an important part of the computer revolution. Indeed, many books and articles are published on it, and many people now make their living evaluating software for specific uses. Programs commonly are evaluated by how user friendly they are, the quality of the display, the completeness of the documentation and the ability of the program to perform the task for which it was designed. In addition to these criteria, it is also important to evaluate the level and type of language used in the documentation and instructions, the existence of stereotypes and/or the absence of appropriate role models or examples, and the degree to which the program relies on specific skills on the part of the user.

Some software is expensive while other programs are in the public domain, which means they can be copied and used by anyone. As a result, price is not always a good criterion for evaluating a program. Some expensive systems are difficult to use and often don't warrant the expense. Thus, shopping for software is a demanding and often confusing task.

Session VII

Info Sheet

Software Evaluation

List those things that make a program work for you:

List those things that make a program unsuitable for your use:

Use your lists above to rate at least three programs you have used in the class:

1.

2.

3.



Session VII

Worksheet

Below are some questions to think about when you listen to the panelists talk about how they use computers.

1. What tasks on your job or at home could be done by a computer?

2. What questions do you have about applying a computer to those tasks?

3. What interests or hobbies would you like to pursue?

4. How could a computer aid you in those pursuits?

5. What questions do you have about applying the computer to any of those pursuits?

6. In what ways can the computer be useful to you? A hindrance to you?

7. In what ways do you think computers change relations on the job or in the home?

8. What other questions do you have for the panelists?

Session VII

Entry Log

80

MTL 95

Session VIII

Overview

Applying Computer Knowledge

Now that you have learned to use the computer for a variety of purposes, to evaluate software, and something about the usefulness of computers, it is important to spend some time thinking about how you will apply this information to your own life. Thinking about how you will deal with the computer revolution is imperative, given the fact that our lives are being changed every day by the introduction of new computer technology not only in the workplace, but also in health care, education, public service, etc. This final session of Unit I is designed to provide an opportunity for you to consider this question. It will also include several evaluation activities. Therefore, this session has been designed to:

- provide closure to the class,
- give you an opportunity to consider how you will use what you have learned from this class and share your ideas with others,
- invite your comments and suggestions on the project and the class,
- provide an opportunity for the class to suggest other resources and opportunities for learning more about computers or applying what you have learned.

Thinking About the Future

PART A — The Computer in Your Future:

1. Imagine yourself 2 to 5 years in the future. How will you be using the skills and concepts covered in Unit I of the READI course? Write several sentences describing this vision of your future.

2. Reread your description of the future. List all the steps you can think of that will lead you to that future. Star any of them you can do tomorrow.

PART B — Write a description of how you would like to see your community using new technology in 5 years:

1. How will it be used in the schools? _____

2. How will technology influence business and farms in the area? _____

3. In what ways will technology affect jobs and who has what work? _____

4. In what ways can technology improve family and home management? _____

5. What kinds of steps will the community need to take to make positive use of technology?

6. What kinds of negative effects can technology have on the community? _____

7. What steps can the community or individuals within the community take to prevent these negative outcomes? _____

Session VIII

Entry Log

SPREADSHEET

Budget

Budget

Group Budget

Budget for job search

Budget

Enterprise budget

DATABASE

Budget, checkbook

Resource file

Mailing list
List of programsMailing list,
list of contactsMailing list of
suppliers and customersBudget
list of suppliers**ELECTRONIC COMMUNICATIONS**

Buying Service

On-line
Investment ServiceGet programs from
bulletin boardsIdaho Employment
Database

Order supplies

Marketing
Service

Answers: Review

FLOWCHART I BINARY
 * * * * * E N A *
 DISK OPERATING SYSTEM
 IO * * * * * R M T I E I
 S MEMORY * * * * * C X C
 K * * * * * G * * * * * BIT R
 D USER FRIENDLY * * * * * O
 R * * * * * A U * * * * * CHIP
 I COMMANDS S * * * * * A R
 U U O * * * * * O T C P A P
 E R N BUFFER R * * * * * C
 S I * * * * * T I I BYTE
 S OUTPUT W N N * * * * * S
 A R O * * * * * A GOTO DOS
 V * * * * * ARRAY R * * * * * O O
 EDITS * * * * * E COMPUTER

Answers: Spreadsheet

FORMULAS MENU
 O * * * * * P E * * * * * W
 R ELECTRONIC H
 M N * * * * * E E A
 A T RECALCULATE
 T E * * * * * O * * * * * L I
 TARGET S * * * * * F
 I * * * * * HELP L
 N RANGE * * * * * DATA
 G * * * * * E * * * * * I B
 * * * * * FUNCTIONS E
 S A * * * * * R K * * * * * L
 A T * * * * * G A * * * * * S
 VALUES BACKUP
 E * * * * * N * * * * * A
 DOCUMENTATION P
 * * * * * Z * * * * * W P E N
 TEMPLATE * * * * * R

Answers: Database Vocabulary

DATABASE * * * * * FIELD * * * * * ESC
 U * * * * * A A * * * * * C A I * * * * * B * * * * * E
 M A D * * * * * T U * * * * * L * * * * * T * * * * * T A N
 P * * * * * S C R E E N * * * * * G E N E R A T O R
 * * * * * I H * * * * * O * * * * * X D * * * * * C
 * * * * * N P * * * * * F * * * * * T H * * * * * H P
 I N F O R M A T I O N * * * * * S O R T
 N O * * * * * O * * * * * L * * * * * G E R
 T * * * * * A C T * * * * * R E C O R D * * * * * Q N E
 E * * * * * B * * * * * E * * * * * M * * * * * R U * * * * * L
 R A S * * * * * R A M * * * * * L A B E L S A
 A C C E S S * * * * * N M * * * * * W R * * * * * T
 C * * * * * K I * * * * * O A * * * * * E * * * * * Y I I
 T U N * * * * * O R G A N I Z E * * * * * N O
 I P I G * * * * * S E * * * * * U * * * * * D E S I G N
 U * * * * * E * * * * * N * * * * * R * * * * * I * * * * * T A
 E N T R I E S * * * * * P R I N T * * * * * L

Answers: Communications

BULLETIN BOARD
 I * * * * * E * * * * * A * * * * * E
 N * * * * * E * * * * * L * * * * * U * * * * * R A M
 A * * * * * L I N E S * * * * * D * * * * * O
 R * * * * * T * * * * * C * * * * * T * * * * * O
 Y * * * * * M O D E M * * * * * R * * * * * U
 I N I T * * * * * M * * * * * M A I L
 N O * * * * * P O R T * * * * * N A
 F * * * * * U * * * * * S * * * * * T
 O P E R A T O R * * * * * P O
 R * * * * * I * * * * * A * * * * * O R
 M * * * * * N * * * * * E T W O R K
 A N A L O G * * * * * E * * * * * T * * * * * R
 T * * * * * I * * * * * U * * * * * A
 I O N * * * * * O * * * * * S Y S T E M
 O * * * * * E * * * * * F * * * * * E
 N * * * * * S O F T W A R E * * * * *

Alternative Design for Unit I

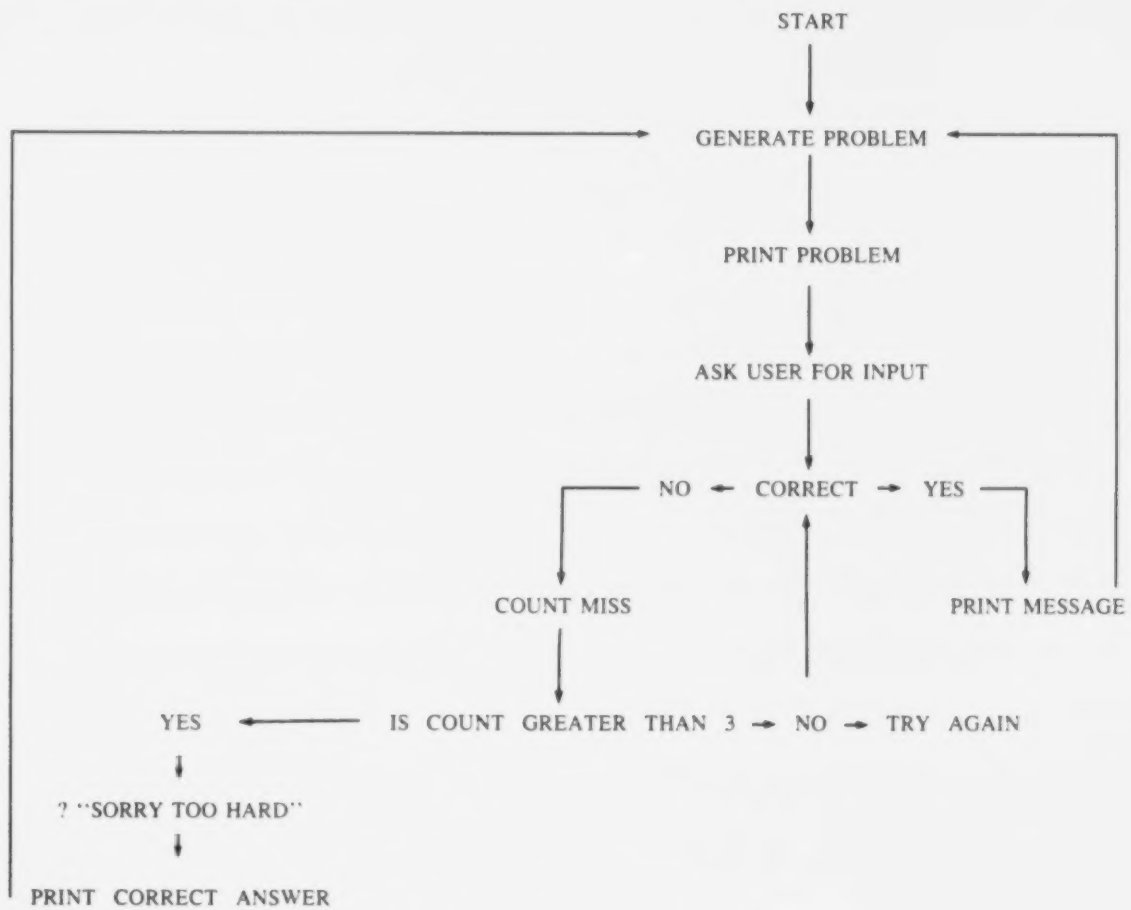
Class I:	Session I, Unit I, page 37
Class II:	Session V, Unit I, page 63
Class III:	Session VI, Unit I, page 68
Class IV:	Session II, Unit I, page 43
Class V:	Session III, Unit I, page 50
Class VI:	Session IV, Unit I, page 55
Class VII:	Session VII, Unit I, page 74
Class VIII:	Session VIII, Unit I, page 76

Suggestions for Combining Unit 1 and Unit II

Class I:	Session I, Unit I, page 37
Class II:	Session II, Unit I, page 43
Class III:	Session III, Unit I, page 50
Class IV:	Session I, Unit II, page 82
Class V:	Session V, Unit I, page 63
Class VI:	Session III, Unit II, page 90
Class VII:	Session V, Unit II, page 98
Class VIII:	Session VIII, Unit II, page 108



FLOW CHART — EXAMPLE



READ!

**Computer Literacy
For Rural Adults**

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Preface

READI is a special pilot project, supported by the Idaho Cooperative Extension Service and the Fund for the Improvement of Postsecondary Education — Federal Department of Education, to develop a program to bring computer literacy to adults living in rural areas and small towns. The State READI office is responsible for both curriculum and the training of peer teachers. The State READI Office is located at Lewis-Clark State College, Lewiston, Idaho.

Although the READI Project is administrated from the Extension state office with the support of the READI state advisory board, each county is responsible for its own program. In each county, therefore, the Cooperative Extension faculty works closely with the local advisory committee and READI peer teachers to provide a program that meets local needs. The project office and local advisory committee welcome any comments, questions or suggestions.

Acknowledgments

READI, a computer literacy program for rural adults, is funded in part by the FUND FOR THE IMPROVEMENT OF POSTSECONDARY EDUCATION and by the Idaho Cooperative Extension Service.

The following people have contributed to the development of this project: Corky Bush, Dennis Brown, Harry Guenther, Joe Guenther, Doris Williams, and Jacie Jensen. Karolyn Rogers, Mary Emery, Jacie Jensen, John Gurgel, and Corky Bush worked on the curriculum.

Members of the project's state board are: Dave Makings, Doug Treadway, Alene Orvik, Muriel Jordan, Loyce Roberts, Karolyn Rogers, James Gissel, Gert Walker, Margaret Bauscher, Shirley Twiggs and Larry Selland.

County Extension faculty working on the project are: Norm Fitzsimmons, Clearwater; Brian Finnigan, Bingham; Vicki Parker, Camas; and Max Gardner, Payette.

Secretarial support was provided by Kristin Haener, Bev Bircher, and Lois Flomer. Sherron Phieffer from EQUALS was a wonderful consultant. Special thanks to Catherine Rolzinski of the Fund Staff and to the other members of the FIPSE Cluster on Education and the Economy for their invaluable suggestions and encouragement.

Staff on the project are as follows: Project Director — Mary Emery; Programmer — Jim Janoch; Assistants — Harriet Whitmore and Chana Dyer.

Computer Applications

A Participant's Manual for Unit II of the READI Program

**Mary Emery
The READI Project**

Cooperative Extension Service

Moscow, Idaho

207

Introduction

In Unit I of the READI program, we spent some time getting acquainted with the computer and experimenting with different software packages. Unit II of the READI curriculum has been designed to focus on the application of computer power to specific problems in the home, on the farm, or in a business context.

Because of the speed with which computers can perform many everyday tasks such as calculating figures, sorting and storing information and printing written material, they are rapidly becoming important tools for problem solving and decision making, at home as well as on the job. Therefore, this course has been developed to provide participants an opportunity to write, compute, and organize information. Indeed, the overall goal of Unit II is to demonstrate the power to solve problems and make decisions. Specifically, in Unit II participants will:

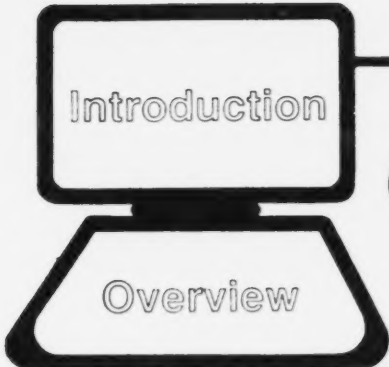
- learn to use the computer as a tool for problem solving and decision making
- use electronic spreadsheets, word processors, and data base managers to calculate, organize, and present data
- develop data files
- design templates for use with spreadsheets and data base managers
- complete a project using the general applications programs

Course Organization

Unit II, unlike Unit I, is designed to follow a problem-solving format. Thus, the course will begin with an overview of the problem-solving process and how a discussion of this process can be augmented by computer power. In order to demonstrate the application of computer power to a specific situation, the class will focus on developing a home budget. Participants will then use the problem-solving process together with their computer skills to apply general application programs on a group project of their choice.

Since individuals are likely to choose different projects and may proceed to different tasks at different speeds, the organization of Unit II is not designed around specific classroom activities, but, rather, the class will learn about each application together and then work in small groups to apply that application to their project. (Sample projects can be found in the Appendix.) Therefore, the manual is organized as a resource guide with sections on each application.

Like the Unit I manual, however, a log sheet is included in each section so that each person can keep track of ideas, feelings, questions, and concerns. These sheets have been included to encourage people to write about class experiences for two reasons. First, any writing helps sharpen writing skills, and second, writing about an idea also helps people further their understanding of that idea.



Introduction

Overview

Computer Application Programs

The power of the computer to assist you with financial, management, and organizational tasks results from three capabilities: presenting information, organizing or calculating information, and storing or saving data. Such software packages are designed as either general application programs or for a specific use like bookkeeping or home financial management.

General application programs provide users with a generic program that they then must adapt to their needs. Three very common types of general application programs are electronic spreadsheets, word processors and data base management systems. Recent innovations of these three general applications have resulted in the development of INTEGRATED software. These programs — including Symphony, Appleworks and Framework — include more than one application and have built-in mechanisms for transferring information from one program to another.

General application programs provide guidelines for entering, manipulating, and storing data. You, the user, however, must take responsibility for tailoring the presentation of data and deciding on the appropriate calculations or methods for organizing information as well as the format for printing hard copy. The format you develop to meet your specific need is referred to as a template.

Specific application programs are written for a particular situation such as farm financial management, business finances, inventory, or mailing lists. With a special application program, the presentation of data is all set up as well as the methods for organizing or calculating information. All you need to do is to enter the actual data. Whether you choose a general application or a specific application program will depend on your own needs, skill level, the time you have available, and the cost of the programs.

In this unit of READI, you will have an opportunity to work with one example of each of the common general application programs. Thus, you will have an opportunity to develop the presentation of data for spreadsheets, data bases, and word processors. You will also set up the calculations or organizational mechanisms for processing that data. Finally, you will be able to store, save, and print out your information. The process of setting up and using the general applications programs will help you learn how computers use information and how information must be organized to use a computer successfully. It will also acquaint you with the power of the computer as a tool for decision making and problem solving related to everyday tasks.

Section I

Introduction

Computers and Problem Solving

Computers are often blamed for errors and mistakes. They are also often described as a panacea for solving any number of problems. For example, advertisers show us how the computer can overcome a child's learning disability, organize a disorganized office, and put a business back in the black. In fact, computers can do none of these things by themselves.

While they have tremendous capabilities for manipulating information, they cannot make decisions or even ~~manage~~ that information without your input. In short, computers will not solve your problems; they can ~~even~~ make them worse. But, given your skills in the management of information, decision making, and problem solving, computers can be a powerful tool to help you get the job done more quickly and efficiently.

In the introductory session you will have an opportunity to use the problem-solving process and examine how the computer can aid that process. Specifically, this section will:

- review the problem-solving process
- illustrate how the process can be applied to a family budget
- provide an opportunity for individuals to develop their own problem-solving application.

Section I

Info Sheet

Computer Power and The Problem-Solving Process

The Computer as a Tool

People often choose to buy a computer because they think it will solve a problem for them such as figuring their taxes, doing their bookkeeping, or straightening out their filing mess. These people are likely to be disappointed. Computers do not solve problems; they are a tool to help organize information so the user can be a more effective decision maker or problem solver. For example, while the computer cannot solve your tax problems, it can help you make a better decision about which forms to use or which deductions to take. If, however, your tax problems stem from the fact that you have never been able to keep track of receipts well, the computer will be of little help.

While computers can save time and energy in keeping track of information, the really hard and painful work of deciding what to do with that information is still up to you. The computer cannot make judgments about what is best for you. It is only a tool to aid you in getting the information necessary to make the best decision.

The idea of the computer as a tool is particularly important to keep in mind if you are considering purchasing one. The first and most important step will be using a paper and pen to write down your needs. If a farmer were to buy a tractor or if a homemaker were to buy a kitchen appliance, each would shop for the item with a clear picture in mind of how it will be used. The farmer would know what tasks his/her new tool would be expected to perform, just as the homemaker would know the jobs for which the new appliance would be used.

These images of the machine working for them would guide each individual through the buying process, particularly in making decisions about which features, brands, and price ranges from which to choose. Each prospective buyer would be aware of the tasks that would be required of the machine as well as the circumstances in which it would be used. The homemaker who wants a vegetable slicer, but never makes his/her own bread would not want to waste money on a fancy kitchen center. Similarly, the farmer who chooses a very powerful, and, therefore, expensive machine has done so based on a careful assessment of the amount of power necessary to perform the tasks for which the machine is intended. In both these cases, the acquisition of a new tool was based on a careful and realistic description of the tasks the new tool will be required to perform. With computers, a complete knowledge of the tasks you want to perform is equally if not more important than a thorough understanding of the hardware. The dangers of buying too little power to get the job done, or spending unnecessary funds, are formidable.

Identifying your needs and being aware of how you make decisions or solve problems will help you apply the computer effectively to the tasks you have in mind. As you go through this class, be aware of potential uses for the skills you develop in both applying problem solving and using computer applications.

Applying Computer Power

Problem solving and decision making evolve from different processes. Each of us has some skills in both areas, but many of us need to learn how to use them together more effectively. Applying computer power requires both problem-solving skills and decision-making skills. While these skills are related, how we use them is often very different. Many of us are good at problem solving, but not so good at decision-making.

Others of us don't solve problems at all well, but are very organized at decision making. Often good problem solvers have a difficult time with the brainstorming and research steps involved in decision making because they just want to focus in and get it done. Similarly, people who make good decisions often can figure out what needs to be done but can't figure out how to do it. To make the best use of your computer knowledge, you will need to learn how and when to apply both of these skills. Let's look at the differences briefly:

Problem-solving skills

1. analysis
2. narrows in on the problem
3. concrete
4. special applications
5. specific content
6. one time only
7. focuses in on the problem

Decision-making skills

1. synthesis
2. looks at the broader picture
3. abstract
4. general applications
5. general or liberal arts
6. often involves commitment over time
7. expands out to alternatives

Think about the way you handle problems or decisions. Do you just want to get it solved and, thus, go right to the heart of the problem? Does this approach work as well on fixing an engine or broken pipe as it does with deciding how to invest your money, to look for a new job, or to plan a PTA meeting?

Describe a problem you solved recently:

What was the problem? _____

List the steps you took to solve it: _____

Describe a decision you made recently:

What was the decision? _____

List the steps you took to make that decision: _____

What is the same about the two lists?

What is different?

If your lists both describe the same process, then you need to expand your skills in another direction. Why do you need to do this? Arriving at a good decision requires working with abstract ideas and not jumping in to get it done without proper research. At the same time, you can't solve a problem until you find a concrete step from which to start.

Problem solving allows you to narrow in on those concrete steps; decision making, on the other hand, requires expanding out to look at all alternatives. In problem solving, you work to discard solutions, while in decision making you must work to include more possibilities. In addition, decision making involves another step. With problem solving, the action is part of the process; but with decision-making, you must include an action plan to make the decision effective. Just think of all those New Year's resolutions — all those good intentions to do any number of things. In these cases, you may have decided on an action, often on the spur of the moment, but did not develop a method for carrying out the decision over time.

Computer power offers an opportunity to do better research in both problem solving and decision making; but if you don't apply the necessary thinking skills, you will end up with the same results as many people get from New Year's resolutions. For example, often people make a resolution to keep better books. They decide they need to do this to solve their tax problems. They buy a computer to 'solve' the problem. But the computer is useless without a plan for record keeping. The record keeping is useless unless linked to a goal.

We have talked about problem solving and decision making as though they are different processes when in fact they are two sides of the same coin. First, both require an individual to clearly identify the problem to be solved or the decision to be made. This step is not as easy as it seems because it includes a number of substeps.

Problems cannot be solved in a vacuum any more than decisions can be made out of context. In the process of identifying the problem or decision, the individual must be aware of how the decision to be made or problem to be solved is related to that person's value system. In addition, the strategy or decision, to be effective, must reflect the individual's larger goals. Value clarification and goal setting are procedures that are often taken for granted, and, thus, are factors in unsuccessful problem solving and decision making.

Once both values and goals have been clarified and the problem or decision to be worked with clearly identified, the next step is researching the options and collecting information on alternatives. This step is particularly important for those who wish to use the computer as a management tool because, without the right data, the computer cannot be the powerful aid it was designed to be. The information you collect will help to identify several alternatives.

When all the information is gathered, the computer can be especially helpful with the next step — analyzing the alternatives you have identified. Spreadsheets are particularly helpful with their ability to run 'what if?' scenarios. This analysis, however, must take place against the backdrop of the values you have identified and long-range goals you have set to be truly effective. Thus, you will want to look at how each alternative fits in with long-range goals as well as how it reflects the values that are most important to you.

The process of identifying and analyzing alternatives requires work. Once that work is completed, the selection of the alternative that will work best for you should be fairly simple. The next step will be to plan a strategy for implementing it. You may find as you begin developing your plan that you need to repeat the sequence as different strategies appear within your overall plan.

The process does not stop, however, with planning and implementing the decision. Once you have embarked on a strategy, it is very important to look back and evaluate for several reasons. Over time this evaluation process may point out areas where your goals or values are at odds, thus preventing you from being as successful as you would like in implementing your plans. By reviewing your process, you will be able to further develop your problem-solving skills. And, finally, the process of evaluating a strategy helps in the identification of new problems to be solved or decisions to be made. Indeed, both problem solving and decision making are ongoing processes that influence both our future and our quality of life.

Let's look at how this process might be applied to the task of setting up a family budget.

1. Identification:

The problem to be solved is:

We are not saving enough money for —
e.g., retirement, education, spring lay-off.

The decision to be made is:

How can we better manage our money?

1A. Value clarification:

Values serve as a basis for how we think, feel, and act. They are the foundation on which attitudes and goals rest. Values are also the standards and beliefs that dictate what is important and how you determine right or wrong. Although values vary from person to person, each person's set of values tends to remain stable through life. Because of their fundamental role in helping you make judgments and choose behavior, values are very important. Below are some suggestions for helping you clarify your values for developing a family budget:

- Make a list of things that are important to you, such as college for children, family togetherness, planning for retirement, recreation, etc. Review your checkbook for the last 3 months, and note in which categories you have spent the most money.
- Write down all the things you want to accomplish in the next 10 years.
- If you had only a limited time to live, what goals would you set for yourself?
- Pretend you are celebrating your 88th birthday. A reporter from the newspaper comes to interview. What would you want the story to say about your life? For what do you want to be remembered?
- Spend several minutes thinking about what you want your life to be like in 3 to 5 years. Write a description of what you see yourself doing, the location you want to be in, the people you see yourself with, etc.
- Take the "Money is..." quiz.

Once you have developed lists for these activities as well as any others that come to mind, go over the lists and prioritize the top three items in each list. What are the similarities; where are there conflicts?

- 1B.** When you have a list of three values that are important to you, list them on the following chart. Use the sample as an example. Using information from your financial records, record your actual behavior or activities in how you spend your money. Look over the charts. Are there some conflicts between values and actions? Think about these issues and re-evaluate the information on the chart, revising wherever appropriate.

ACTIVITY CHART

VALUES	Example: Financial Security		
ATTITUDES			
GOALS			

2. **Gathering information:** Using the information from a variety of sources, including the exercises above, discussions with your family, and your financial records, develop a profile of your spending needs and your income sources.
3. **Identify alternatives:** Once you have a profile to of how you spend your money, discuss various ways of budgeting your income. What alternatives exist? Is refinancing a possibility? Can you pay off a loan early and save on the interest?
4. **Analyze alternatives:** Once the alternatives are clear, you can begin the process of evaluating each one. It is at this stage that spreadsheets can be very helpful. With the spreadsheet you can work with each alternative, but the machine will automatically recalculate as you change values. (If you use the template for the enclosed budget, you can examine the formulas used to calculate values. By putting the cursor on the appropriate cell, the program will list the value references for that cell.)
5. **Set goals and plan strategies:** Once you have gathered your information and done some research on alternatives, you are ready to set goals. To set financial goals for your budget, you need to keep your values in mind as much as your fiscal resources. Set goals for your budget, and plan a strategy for reaching these goals.
6. **Implement your plan:** No plan ever works as long as it stays on paper. So, now that the planning is done, it is time for the doing.
7. Finally, you will need to evaluate and revise your budget after several trial weeks or months. Evaluate your experience to see how well the budget is helping you reach your goals. Is the budget an effective strategy? Are your goals realistic as stated? How can you modify your plan to use your money more effectively?

In addition to using the electronic spreadsheet for budgeting and financial records, data base management systems can help with financial record keeping. Also electronic communications can allow the user to do banking transactions from home. Finally, word processing programs can help with a number of tasks related to family budgeting and record keeping.

Section I

Worksheet

Money Is... A Value Clarification Exercise*

*[rank each item within sets
from 1 (most agree) to 5 (least agree)]*

1. ☐ A. You must spend a little more than you can afford to get ahead in life.
☐ B. Paying in cash is the best way.
☐ C. A lot of money would be nice, but not really essential.
☐ D. It's terrible to have to wait for something you really want.
☐ E. There's no need to budget — either you have it or you don't.
2. ☐ A. Money and prestige — they go hand in hand.
☐ B. Don't buy until you have to have something and then try to be sure.
☐ C. I spend my money on what I care about most.
☐ D. Money is to spend.
☐ E. If you need money it will come from somewhere.
3. ☐ A. None of that cheap stuff is worth much.
☐ B. It's a good feeling to have money in your pocket.
☐ C. There are a lot of things more important than money.
☐ D. It would be wonderful to be a millionaire — all that money just to spend.
☐ E. Why worry about money?
4. ☐ A. If you have to scrimp and save, other people shouldn't know.
☐ B. Thrifty people manage best.
☐ C. It seems silly to try to keep up with the Joneses.
☐ D. My list of 'things to buy someday' is endless.
☐ E. Worrying about money never helps.
5. ☐ A. I'd like to have nothing but the best.
☐ B. Look around until you find the best price.
☐ C. It's easy to have fun with simple things, not necessarily connected with spending money.
☐ D. A person is entitled to some of the 'nice things' from life.
☐ E. Just wait and money problems wither, go away, or take care of themselves.
6. ☐ A. A person has to look successful.
☐ B. Every penny should be carefully watched.
☐ C. Enough money to live comfortably, but not necessarily luxuriously — that's enough for happiness.
☐ D. The more money you make, the less you have.
☐ E. If there's really a serious financial problem, someone will always help.
7. ☐ A. Nothing is too good for one's children.
☐ B. Spend only for necessities.
☐ C. Money doesn't buy happiness.
☐ D. Happiness is buying something brand new.
☐ E. Why even try to make plans with money?

*Adapted from Quiz developed by Dorothy Price

8. _____ A. A fancy car and a good-looking house spell success.
_____ B. A person can't have too much insurance.
_____ C. The purpose of money is to serve the family, not to be served by it.
_____ D. There are always more things to do than there is money to do it with.
_____ E. Live from paycheck to paycheck and don't fret about it.
9. _____ A. Buying at the best stores is important.
_____ B. Having no cash savings is frightening.
_____ C. It's hard to see why a person would let herself become a slave to money.
_____ D. What did people ever do before credit?
_____ E. A budget is only for someone who thinks money is everything
10. _____ A. A big income means a person has really arrived.
_____ B. Every debt should be cleared up as one goes along.
_____ C. Children should learn not to put a dollar value on everything.
_____ D. It would be easy to spend \$5,000 in just a couple of days.
_____ E. A person can get along without savings.

Scoring of Money Is

After all the sets have been ranked, score the items. To do so, add the ranks for all the "A" items together. Then add the scores for the "B" items together, etc., until all five types of statements have been scored. Then consider the following:

- A = Status Values
B = Security Values
C = Self-actualization Values
D = Self-indulgence Values
E = Faith or Fate Values

The higher the score, the more one tends to exhibit the values of a given category. The lower the score, the less one exhibits a given set of values.

Section I

Log

Section II

Introduction

Writing with a Word Processor

Word processing is perhaps the most common computer application. Almost anyone who writes has access to a word processor these days. The flexibility and ease with which a writer can change, edit, or experiment with his/her writing has not only increased the number of people who write and how much they write, but it has also changed both the way people write and their feelings about writing.

In this section we will look at word processing in terms of both its potential applications as well as the way word processing can affect writing. Specifically, you will:

- learn what you can do with a word processor
- practice using a word processor to describe your problem application
- examine the various functions of word processing packages
- discuss the potential impact of word processing on your writing style
- discuss the value of the writing process as a tool for problem solving.

Word Processors

What Is a Word Processor?

A word processor is a software program that enables a person to type, edit, and print the written word. Although word processors vary a great deal, each program has a means for accomplishing these three tasks. While inputting text is much the same as typing text on the typewriter, it is with the editing and printing functions that a word processor can really show its stuff.

In Unit I we discussed the three stages of the writing process: (1) the discovery or idea stage, (2) the writing/re-writing stage, and (3) the editing stage. Word processing is especially helpful to writers because it can simplify much of the laborious work of writing. In addition to easing the hard work of correcting spelling and changing words, word processors also provide a means by which a writer can easily move text, reorganize information, or try out different phrases. Thus, word processors are much more than just work horses; they are important tools for expressing one's creativity and enhancing one's word craft.

What Can a Word Processor Do for Me?

With a word processor you can write letters, reports, journal entries, almost anything you like. You can do almost anything you could do with a typewriter and more. Most people begin using the functions of a word processor to correct typing and spelling errors in the text. As a person becomes more familiar with the functions of the program, however, and more at home with writing, it becomes almost second nature to experiment with text, style, and presentation. Indeed, you can edit to your heart's delight and still produce a perfect copy without having to be continually retyping your text.

In addition to simplifying the mechanical aspects of writing and enhancing your writing style, many word processors also include mail merge functions which allow you to send one letter to a list of different people. This feature is particularly helpful to those who regularly use a mailing list.

Word processors don't, however, work alone to produce good copy. The appearance of your hard copy or printout will depend on the type of printer you have. With the exception of laser printers, dot matrix printers generally produce faster copies but with poorer quality. Letter quality printers are slower, but turn out hard copy that is generally of high quality that can be easily reproduced.

How Do They Work?

Word processors have three functions. They allow you to input information, to edit it, and to print or store it. The input function is very similar to that of a typewriter, although most programs give you more control over where the CURSOR is. Most programs allow you to SCROLL up and down the pages, moving the cursor to any point in the text. Some allow you to move forward or backward more than one page at a time.

The editing functions of the word processor range from fairly simple commands such as INSERT, DELETE and OVERSTRIKE to more complicated MOVE or COPY text and SEARCH and REPLACE functions. With the MOVE or COPY function, you can rearrange your text easily, experimenting with different sequences by moving phrases, paragraphs or pages to new locations. The SEARCH and REPLACE or FIND functions allow you to locate any particular word or phrase anywhere in the text.

This is particularly useful for people who tend to make the same errors over and over. When entering text, you can use the SEARCH and REPLACE function to change all those typos at once. In addition to facilitating these sorts of changes in the text, word processors also give you more control over format. You can change margins, spaces, and sometimes even the size of the characters.

How Do Word Processors Differ?

Questions you might ask when choosing a word processing program include:

	YES	NO
- Will the program hyphenate words when it justifies?	_____	_____
- Does it scroll vertically and horizontally?	_____	_____
- Can you move around easily within the text?	_____	_____
- Is there a spell check program available?	_____	_____
- Is it compatible with other programs?	_____	_____
- Can I format it to an ASCII or Diff file?	_____	_____
- Does it have split window capability?	_____	_____
- Can you copy and/or move text from one place to another?	_____	_____
- Can you easily insert lines, characters, paragraphs, or even pages?	_____	_____
- Does it allow you to delete lines, characters, words, or paragraphs?	_____	_____
- Does it automatically wrap around or format your pages?	_____	_____
- Is it menu driven?	_____	_____
- Are the commands easy to use and remember?	_____	_____
- Can you search and replace words or phrases?	_____	_____
- Is there a tutorial or demo with the program?	_____	_____
- Is the documentation easy to read?	_____	_____
- With how large a document can I work on this program?	_____	_____
- How easy is it to format your text, i.e., tabs, margins, underline, center, etc.?	_____	_____
- How easy is it to back-up, save and print your work?	_____	_____

If you are thinking of purchasing a word processing program, be sure you have a clear idea of how it will be used before you actually try one out. You might take some everyday writing tasks with you when you look at software. If you are thinking about getting a computer for the home or office and haven't considered word processing, investigate this possibility before looking at hardware because word processing will be an important application for nearly every computer user.

Section II

Info Sheet

Using a Word Processor

In this class you will have an opportunity to do several pieces of writing. You will write your problem statement and your plan of action which will be shared with others. Many of your projects will require some use of the word processor, either to do flyers, letters, or reports. You will also need to write a summary of your experiences working on the project.

In the earlier READI class, we introduced the idea of writing as a process. As you work through the writing tasks associated with this class, keep the stages of writing in mind. In addition, since many of you will be working in groups on solving problems, you will probably do at least some writing in a group context.

Since the discovery stage of writing often revolves around the generation of ideas as well as problem solving, the process by which your group chooses a project will in some ways replicate the discovery stage. Once you have identified a problem and discussed the steps involved in working with it, you will have a good idea of what the written description of your problem will look like.

As you begin to put those ideas into prose, your group will have to decide how to work together. Although it would be simpler to just assign parts of the description to different members of the group, this method may not produce the best work. Issues skipped over at this stage because the group process was not used may crop up later. If everyone participates in the discovery and writing stages, however, your group will generate more ideas, insights, and information. The ideas resulting from this process of group discovery can be compiled into a more elaborate outline.

At this point, your group may want to parcel out parts of the description. You will also want to give everyone a chance to write and have others react to their writing. Each person in the group should also have an opportunity to work with the editing functions of the word processing program you are using. Finally, you may want to exchange descriptions with another group, so each group can give the other feedback on what they think another group is trying to say.

As you work with the writing tasks associated with your problem or application, you will want to work with each other on clearly identifying the purpose of the writing and the audience for whom it is intended. Each person can use this experience as an opportunity to develop their skills in persuasion, describing details, and organizing ideas. With each task and the final summary, the group should give each person a chance to engage in some prewriting work, writing, and rewriting, as well as editing.

Tips for Writing With a Word Processor

Using the Word Processor

- Save often . . . If the power goes out and you haven't saved your last revisions, you've lost it!!!!
- Keep an up-to-date back-up for all your copy.
- Figure out a logical method for naming your files, and keep an accurate catalog for all your disks.
- If your program allows you to develop formats, save the ones you use often to avoid duplicated work.

Tips for Prewriting

1. Begin writing down any ideas or notes as soon as you know you will be working on a particular piece of writing.

Tips for Writing/Rewriting

1. Before writing, envision your audience, and think about your purpose in addressing them.
2. Go through your notes, and use the main points in an outline.
3. Get your main idea out first, and organize the rest of your key ideas into short paragraphs.
4. Write your first draft quickly, without thinking too much about punctuation or grammar. Concentrate on getting the ideas on screen.
5. Avoid flowery language.
6. Some people like to write their draft at the bottom of their note file so they can delete notes from the top as they are incorporated into the text.

Tips for Editing

1. Check to see how clearly your main point stands out.
2. Check the organization of your ideas. If they don't flow well, use your MOVE function to try out a different organization.
3. As you read through your text, cross out anything that isn't vital to your purpose.
4. Bring related points together in a single paragraph.
5. Check to see how well sentences and paragraphs follow each other. Do you need better transitions between ideas?
6. Look over your text to see if you have used parallel constructions. That is, in your lists are all the items questions, verbs ending with -ing, or have you mixed different forms together?
7. Edit for brevity; use simpler words and phrases.
8. Make your piece alive by using active verbs and avoiding the "has been's," "has resulted's," "did appear's", and other passive voice expressions.
9. Is your attention getter effective? Is it followed by a concise needs statement? Do you include information to backup your assertions? Is your conclusion clear? Did you include an action people can take in response to your statements?
10. Did you motivate the reader by addressing his/her immediate needs?

Section II

Info Sheet

Writing with a Word Processor

When we think of the Information Age and the increased role of telecommunications, it seems as though the written word no longer plays the important role it has played in the past. Even though you may find yourself entering numbers on a keyboard and using the phone more often, writing skills are likely to become even more important as access to word processors and telecommunications increases. Therefore, it is extremely important for you to think about your relationship to the craft of writing, particularly since writing with a word processor makes the craft so much easier to practice.

Writers themselves, after some initial skepticism, are among the most enthusiastic word processor users. Just as technology has changed many tasks, word processing is also changing the craft of writing. The changes involve not only who writes and how quickly and easily they can produce text but also the manner in which writers experience writing. Word processors are quickly becoming important tools for anyone who writes, either for occupational reasons or simply for the joy of it.

There are several reasons why word processors are so enthusiastically praised. One reason is that the word processor lets you get information down faster. Since we think much faster than we can write or often type, writing can be frustrating as ideas get lost in the flurry to get words on paper. Word processors cut down on the lag time. One outcome of the speed and ease word processors lend to writing is the ability of writers to engage in what has come to be called "fingertip thinking." Using the computer, writers can let their creativity surge as fast as ideas can flow through their fingertips.

Since anything can be easily erased, saved, moved, or modified, nothing is permanent on the screen in the same way it is with paper and pen or typewriter and paper. There is, therefore, no sense of being bound to what has been entered. Word processors not only offer a solution for overcoming the physical barriers to writing such as sticky typewriter keys, but they also can help overcome the psychological barriers to writing, such as, the dread of having to retype it one more time. As one writer put it, the blank screen is friendlier than the blank page. Thus, word processing can free the writer of physical constraints as well as reducing writer anxiety.

Writing is a useful skill to develop for several reasons. It is an important method of communicating. For many people, writing is also a tool for exploring personal development and improving self-image. Journal writers use writing as a mechanism for working through problems, understanding feelings, and feeling good about themselves. Moreover, those who write often — authors of journals, letters, or editorials — experience some self-discovering through writing, and often find themselves working out problems or feelings in their writing. Finally, writing is an important problem-solving tool in its own right because, after all, writing is thinking. Whatever the application, the ability to do fingertip thinking can stimulate us all to bettering our writing craft.

Writing to Communicate with Others

Writing is an important tool for communicating with others, whether you want to share experiences with family or friends or change another's viewpoint on a social issue. The first task in such writing is to clarify with whom you will be communicating and why. Will your writing likely be confined to letters to family and relatives, or do you imagine yourself writing letters to the editor? Will you be trying to communicate your experiences to others in similar situations? Or, perhaps you think of your writing future more in terms of advertising, either for your business or for your favorite volunteer organization.

To whom you will be writing and why will influence how you work on your writing craft. For example, if you are thinking of writing informally to relatives and friends, you can improve your communication by working on improving your detail writing. If you are interested in improving your ability to write prose or fiction, you may want to work with character development, describing significant experiences and working through sequences. To develop skills in persuasive writing, you will want to identify and understand potential audiences and learn how best to communicate clearly with them.

Writing as Self-discovery

Among the most common writers are those people who keep diaries or journals. These writers record daily events in their everyday lives as well as their reactions to the larger issues and events of their time. Journal writing provides the writer with a medium for expressing feelings and reactions and a place to work through ideas and concerns. Often in the process of rereading previous entries, writers can recognize more clearly both strengths and weaknesses as well as growth and development. Although the majority of these records are written primarily for personal use, both historians and future family members have found them to be of great value. Not only do such records provide chronological accounts of the individual, but they also give insight into the attitudes and ideas of the time.

While many journal writers write primarily for themselves, all writing can have some impact on who we are and how we feel about ourselves. Because writing is a personal experience as well as an opportunity to do some thinking, it necessarily has an impact on self-image. Many writers can look back at earlier pieces and recognize aspects of themselves which they have outgrown.

Writing as a Problem-solving Tool

Many educators now use writing as a problem-solving tool in their classes. And, indeed, working through the writing process mirrors the problem-solving process introduced earlier in several ways. For example, prewriting activities involve needs assessment, research, and goal identification. You need to know to whom you will be writing and why, in addition to searching out support for your ideas. In the writing/rewriting stage, you work at organizing ideas much the same way that you would organize alternatives and plan strategies. An outline to organize ideas for a piece of writing is very similar to a plan for accomplishing a goal. Finally, editing involves both evaluation and the identification of new problems. As you edit your work, you are likely to find previously unanswered questions or new angles to existing concerns. It is not, however, just the structure of the process that lends itself to problem solving; it is also the process of writing itself.

Writing and Thinking

The process of searching for connections and relationships that is inherent in organizing ideas for a piece of writing can profoundly expand an individual's understanding of issues. Good writers are also critical thinkers; they question information and search for new interpretations. Writing also involves learning to look at relationships from new vantage points. Indeed, writing is often a medium for better understanding relationships, both relationships among ideas and people as well as between individuals and the world in which they live. Writing as reflection can be a means for transforming or enhancing a person's sense of whom they are as well as an understanding of the world in which we live. Writing also provides an avenue for sharing our experiences and for expressing the meaning of those experiences to others. Writing is often emotional; it comes from the writer's experience.

Writing is thinking! Since thinking is more often than not hard work, it is no surprise that writing is also experienced as hard work. Some of the difficulty in writing, however, comes from trying to shortcut the process. When a person sits down to write, he/she is often impatient with his/herself for not getting down to task. In fact, many people, among them some of the best writers, find themselves frozen by the blank sheet of paper, or the empty screen for that matter, and blame their writing skills for that block when, in fact, they have not really done the thinking necessary to get the writing process started.

Some people can start their writing process with a blank sheet and have no trouble with getting that first word or sentence down, but for many of the rest of us the thinking behind writing must precede facing the blankness. Everyone has their own way of getting the thinking accomplished. Some of us think alone, in the shower, or while we are fishing, for example. Others find that putting the concern on the back burner to simmer for awhile helps to get the thinking process to a place where the actual typing words on a paper or the screen can start. Still others get some of their best thinking done talking to friends. How do you think about things? Do you often get impatient with yourself for not getting down to business when the ideas just haven't been worked through enough? Have you worked out a process for yourself for doing the thinking and getting ideas down on paper?

Thinking does not stop, however, with the first draft. The process of getting your ideas down and rereading them often raises new questions and concerns which continue to spur the thinking process. For instance, once you have your original ideas down, you may run across something that doesn't sound right. Often this is a signal that more thinking has to be done, and, therefore, the search for the right word or phrase will continue to frustrate you unless you do the additional thinking necessary to clarify the idea. Many writers suggest that if you find yourself stuck in such a situation, that is probably a clue that more "simmering on the back burner" is needed. In such cases, time might be better spent taking a break and returning to the task with a fresh approach and, hopefully, a new insight.

Once you have developed a reasonable draft, sharing it with others can further clarify your ideas and thus stimulate more thinking. We talked earlier about writing as mediating relationships between people, between people and ideas, and between yourself and ideas. Working with others to clarify your writing can increase understanding, both yours and theirs. Such discussions can open new horizons and perhaps even bring that thought teasing you in the back of your mind into focus. As more and more people begin using word processors, the opportunities for sharing ideas will expand.

For those of us experiencing the rapid changes in rural areas and small towns, writing about those changes and how they affect us and our neighbors can be an important tool for reassessing where we are and what the future direction of rural communities will be. Not only do we have a need to better understand what these changes mean for our own lives, but also we need to consider new possibilities. Written communications will have a profound affect on how people understand these issues and act on them.

Developing your Writing Style

While all writing is made up of the idea generating prewriting activities — the roll up your shirt sleeves rewriting work — and, finally, editing, each writer's method of writing is distinctive. And although the writing process is primarily a thinking process, technology can have an important impact.

In the book by Fluegelman and Hewes, *Writing in the Computer Age*, the authors discuss the impact of computers on writing style. Since you can correct as you go, the word processor can make a difference in your writing process. Indeed, the authors found that word processing writers use three distinctively word processor-oriented styles in their writing:

1. Sprint writing is when you sit at the computer and write as fast as the ideas come. This style is especially suited to circumstances when you are actually doing the thinking as you write. Often sprinting turns out to be prewriting, but occasionally the blend of mind and machine turns out some excellent writing that requires little rewriting or editing.
2. In Stride style you work carefully, usually from an outline or preconceived idea of the outcome. In some ways the stride style on the word processor allows you to write and rewrite at the same time.

3. The reworking-in-progress style used by those who write often combines the writing and editing stage.

Think about your own style of writing. How do you approach the different stages of writing? Do you use a different style for different types of writing, or does your writing always follow the same pattern? Think about the styles that work best for you, and then try out various other combinations to see how they affect your writing. Finally, think about how your style of writing and your approach to the writing process has changed over the years. How do these changes reflect your self-image and self-confidence?

Section II

Worksheet

Word Processing Vocabulary*

Automatic Wraparound — A word that is too long for the end of a line is moved down to the beginning of the next line.

Cursor — A special marker on the video screen that tells where the next character you type will appear on the screen.

Delete — To erase or eliminate a character, word, sentence, paragraph or file.

Edit — To add to, subtract from, or make any desired changes to letter, story, paper, or other text.

File — A story, letter, paper, or other text stored on a diskette or cassette.

File Name — A name given to a file so it can be stored and retrieved from a diskette or cassette.

Insert — To add characters, words, sentences, and paragraphs to the text in memory.

Justify — To adjust the spacing of the text between the left and right margins so that both margins are even.

Load — To transfer a program or file from its storage device into memory; same as retrieve.

Margins — The space between top, bottom, left, or right edge of the paper to the printed text.

Memory — A temporary storage area for text; while it is in memory, the text can be edited or printed.

Process — To sort and resort bits of information.

Retrieve — To restore text from a storage device to memory; same as load.

Save — To permanently store a story, letter, paper, or other text on a diskette or cassette.

Search and Replace — The capability of a word processing program to locate a word or phrase and, if necessary, to replace it with another word or phrase.

Text — A group of characters or words such as letter, stories, lists, and papers.

Word Processing — A program to assist in getting words and ideas down on paper and then make editing easy.

40/80 Column Display — The video screen displays either 40 or 80 characters wide.

• Developed by Jacie Jensen, former Extension computer specialist, University of Idaho, Moscow.

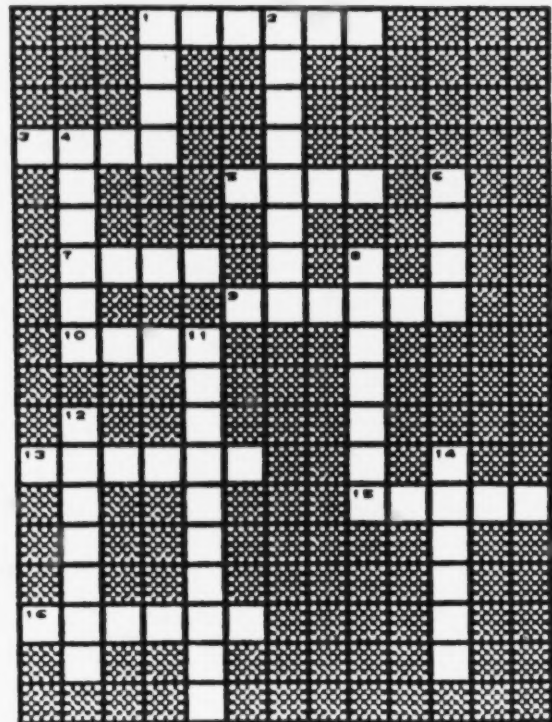
Word Processing Crossword*

Across Clues

1. To locate a word, you would _____ for the word.
3. A letter stored on a diskette is called a _____.
5. The best processor is the _____.
7. To add to, subtract from, or make any changes to text.
9. A temporary storage area for text.
10. Another word for story, letter, list, or paper.
13. With a word processing program, your cursor becomes your _____.
15. One advantage the computer has over humans in editing and storing is _____.
16. Another word for erase.

Down Clues

1. When you store a file on a diskette, you _____ it.
 2. To restore text from storage to memory.
 4. To add information to text in memory.
 6. A word processing program makes stories _____ to write.
 8. A video screen displays either 40 or 80 _____ wide.
 11. A word processing program turns the computer into an electric.
 12. A _____ makes hard copies.
 14. One of the H's in 4-H is _____.
- Developed by Jacie Jensen, former Extension computer specialist, University of Idaho, Moscow.



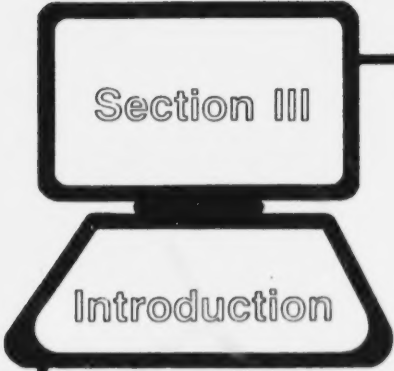
Section II

Log

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Section III

Introduction

Programming as a Problem-Solving Strategy

Programming your own computer application is an option some people choose. This option is most useful when you enjoy programming and have developed some skill at it, when you have a repetitive task that can be done easier by machine than by hand, and when you have the time and energy to spend on programming. In this section you will have an opportunity to:

- think about the possible programming tasks associated with your problem
- review some of the basics of programming
- work with your group to write a short program

Programming and Problem Solving

Many people have commented on the similarity of programming skills to both problem-solving skills and writing ability. The TRANSFERABLE logic skills involved in these three tasks are those that enable individuals to identify problems, set goals and objectives, and organize information in a logical and useful fashion. We touched on some of these skills in Unit I when we talked about STRUCTURED or TOP-DOWN PROGRAMMING.

When To Program?

The following guidelines may be helpful in deciding on the value of programming your own application.

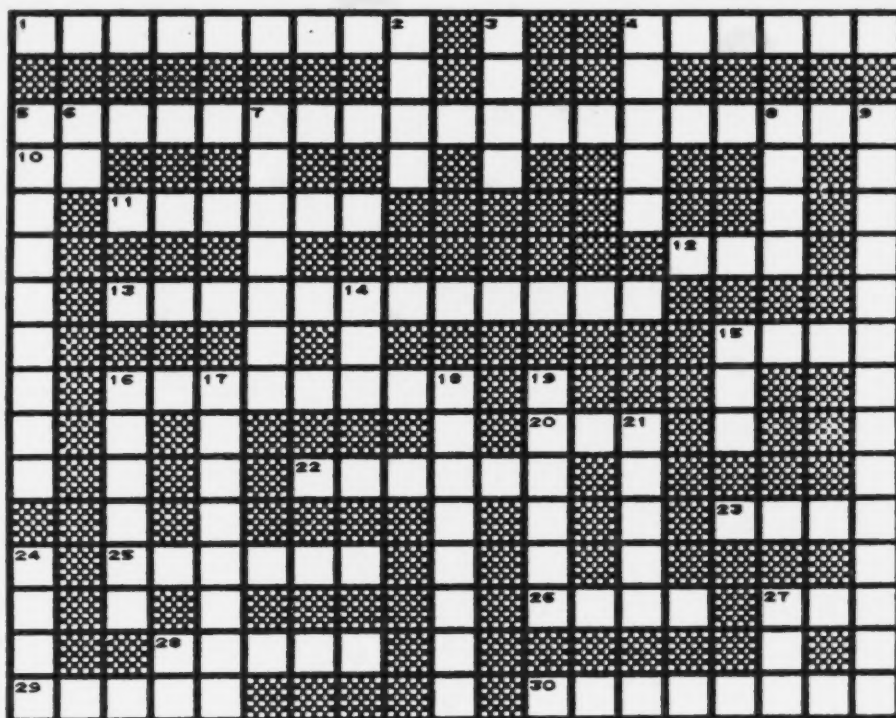
- Can I do the calculations by hand faster than the time it takes to enter the information in the computer?
- Is it a task that gets done often?
- Is it worth my time to replicate something that may be already available?

Programming and Problem Solving

Using the guidelines above, brainstorm tasks associated with your group's application or problem that could be done easier with a computer. Choose a simple task or part of a task.*

- Break the steps into smaller steps. Then, put the steps into the proper order, indicating points where the action branches or loops. Use this information to develop a flow chart of the subroutines that would make up the task. Try programming from the flow chart. Refer to the Unit I manual if necessary or to the manual accompanying the computer. Once you get the program to run, ask members of other groups to try it, and evaluate its usefulness.

* Examples of tasks might be figuring crop price by entering number of bushels and price per bushel, MPG by entering miles, cost of fuel, and number of gallons, figuring budget by entering expenses and income for the week, etc.



Across Clues

1. Series of boxed statements that describe a task.
4. Number system of 1 and 0.
5. Information that tells the computer how to use the information on a disk.
10. Input/output.
11. The parts of the computer used for information storage.
12. Binary digIT.
13. Programs that are easy to use and treat you with respect.
15. Semiconductor on a silicon wafer.
16. Instructions for the computer.
20. Beginning of a file.
22. Temporary storage.
23. Usually 8 bits.
25. Can be screen, hard copy, or telephone transmissions.
26. Instruction for a loop.
27. Disk operating system.
28. Matrix or other arrangement of cells in the memory.
29. What one does when he/she corrects a program.
30. Device for manipulating information.

Down Clues

2. Working together.
3. Initialize.
4. Beginner's All-purpose Symbolic Instruction Code.
5. Peripheral device that stores and retrieves information.
6. Input/output.
7. Series of instructions that tells the computer how to perform a task.
8. File from a word processor.
9. Chip that performs an operation one step at a time.
14. Instruction to the computer.
15. Computer assisted instruction.
16. Marks the position where the next character will appear.
17. CRT's or VDU's.
18. What you should learn about before looking at hardware.
19. Series of characters treated as one unit.
21. Command to get hard copy.
24. If you don't you'll be sorry.
27. _____ matrix printer.
28. Preposition.

Section III

Log

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Section IV

Introduction

Electronic Spreadsheets

One of the most powerful and useful computer applications today is the electronic spreadsheet. These marvelous programs allow you to do complicated bookkeeping faster and more effectively than you would have imagined possible. Not only do they perform lengthy mathematical operations without errors, but they can also allow the user to run "what if?" scenarios. For example, with a spreadsheet it is very simple to see the result of . . . what if I depreciate my new equipment in 5 years instead of 7 . . . or, what if I pay off my bank card this month instead of over the next three months?

Although any task that involves lengthy computations or repetitive math operations can be aided with a spreadsheet program, finances are perhaps the most common application for spreadsheets. And, while electronic spreadsheets can't solve your financial problems, they do make it easier for you to get your records in order and perform complicated calculations.

In this section, you will have the opportunity to embark on a new experience with numbers. Specifically, you will:

- learn how to design a template for a spreadsheet
- examine possible applications for spreadsheets
- practice using a spreadsheet in your problem situation
- learn about different types of spreadsheets

Electronic Spreadsheets

What Is an Electronic Spreadsheet?

An electronic worksheet is a software program that allows you to organize information, calculate or manipulate numbers and store or print your results. Electronic spreadsheets are a general application program. That is, the program has some basic features, but you must tailor it to the purpose you need it to serve. Specific application spreadsheets are available as farming, accounting or business programs already tailored for that particular purpose.

When you use a general application program, you need first to format it to meet the needs of your specific application whether it be balancing your checkbook, figuring your taxes or keeping track of investments. The format you develop for this application can be used over and over. This format that you save on a second diskette or DATA DISKETTE is called a TEMPLATE. For example, you might think of a bookkeeping workbook with columns and lines. If you take one page and format it to do your taxes, the resulting labels and relationships among numbers would be your template.

There are many versions of spreadsheets on the market. Some of the most commonly known are: Multiplan, Visicalc, Lotus, and Perfectcalc. While these programs differ in some ways, in general they all share some basic features. These features include the ability to organize your information into rows and columns, the ability to store and print the results of your computations and finally, the ability to perform calculations and manipulate numbers electronically.

What Can An Electronic Spreadsheet Do for Me?

Electronic spreadsheets have numerous applications. Among the most common are:

- keeping track of your checkbook
- family budgeting
- depreciation schedules
- tax information
- farm, ranch or business bookkeeping
- investment planning

One of the things that makes the spreadsheet so useful is that it allows you to predict the outcome of a particular action. Once you have the right template developed, it is very easy to see the results of taking a 5-year depreciation as opposed to a 7-year depreciation, for example. One has only to enter a different value for number of years, and the value references you have established provide the computer with all the information necessary to automatically recalculate the results.

How Do Spreadsheets Differ?

Despite the similarity among spreadsheets, there are also big differences. Those differences reflect the types of differences common to all software packages such as:

- type of computer and computer specifications, e.g., memory
- price
- user friendly vs. unfriendly (you are the only one that can determine this aspect)

Other differences include:

- size of spreadsheet
- ease of cell identification
- calendar and clock options
- ability to change column and row widths
- function to keep your label column on screen
- inverse video
- credit and debit notations
- screen split to view two windows
- list of functions and formulas
- insert rows and columns
- global search and replace
- print formatting
- interface to other programs
- page titles
- access to tutorials and help screens

Before deciding on a spreadsheet, read articles in magazines that cater to your interest on spreadsheets. Also check with other users to see what they use and how it works for them.

In addition to spreadsheet programs, there are also several prepackaged templates for specific spreadsheet applications. Among them are agricultural programs on depreciation and soil composition as well as home budgeting and tax schedules.

Section IV

Info Sheet

Working with an Electronic Worksheet

In order to understand the functions of a spreadsheet, it is important to understand the three types of information these programs use. LABELS allow you to organize your rows and columns. Labels can be any character, either numbers or letters, but the information in a label is always treated alphanumerically; that is, no calculations can be performed on labels. In the Family Budget example from Session I, difference, food, and total income are all labels. VALUES represent specific numeric items in your spreadsheet that will be used in calculations. VALUE REFERENCES refer to the relationships among the VALUES you input. You will note that cell D18 represents the sum of the other numbers in that column. One of the great assets of an electronic spreadsheet is that we can set the VALUE REFERENCE according to cell position, so that if we want to change numbers, the sum will be recalculated automatically. Thus, we can tell the computer to total column D6-17 regardless how of the numbers change in the column.

The electronic worksheet looks just like a page from a bookkeeping ledger with blank cells that are identified by the row and column. So the ninth cell down from the top and four cells in would be identified on most spreadsheets as, D9. If you examine the sample family budget, cell D9 contains the amount expended for transportation. As you fill in the cells with LABELS and VALUES, you will also be developing VALUE REFERENCES which refer to the relationship of one set of numbers to another.

Using Your Software Program

Some programs have a tutorial on the disk to guide you through the basic operations. Others have a step-by-step tutorial in the manual. You may want to take advantage of these options to better acquaint yourself with the software package you are using.

Whatever the system, each program has a menu of activities from which you may choose to store, present and calculate your information. Visicalc and Lotus both use the "/" to allow you to select different activities. Appleworks lets you access different parts of the program with open-apple commands. Each program also has a help menu to provide guidance if you get stuck.

Designing Your Template

Like many other computer applications, the first step in using an electronic worksheet is to take up paper and pencil. To make an effective and useful template, you must first carefully plan what the worksheet is to do for you and how you want it done. Without this preplanning, it is very easy to end up with information that cannot be used easily because it is labeled wrong or in the wrong column. Therefore, to begin working with a spreadsheet think carefully over the following questions:

What questions will I answer using the information on my spreadsheet?

What types of information will I use?

How will I label my information?

What values will I use?

What value references will calculate my answers?

Once you have answered these questions, use the spreadsheet layout at the end of this session to design the template you wish to develop.

Once you have learned the method for accessing different parts of the menu, you are ready to begin entering your information. Using the worksheet and the answers to the questions above, you can input the information so that it is presented in a logical and useful way. To enter information and arrange it, you will need to know how to do the following:

Moving the Cursor — Learn the commands that allow you to move the cursor from cell to cell, up and down, and across. Most programs also have a method for accessing any cell with a special command such as the Visicalc GOTO command.

Entering Data — As you begin entering information, you will note that in most programs if you start with a letter, the computer accepts it as a label, while if you start with a number, the computer will register a value. Since labels can begin with numbers (although they will be treated as alphanumeric quantities), most programs have a method for telling the computer to make a label despite the fact that you are using a number. Similarly, there is a method for alerting the computer to the fact that the letter you are entering must be accepted as a value.

You might be wondering how a letter can be a value. One of the most useful things about spreadsheets is they allow you to enter the cell number, i.e., D10 instead of the actual quantity. Why would you want to do this? There are several reasons. Entering the cell location might be shorter and easier. But secondly, and more importantly, entering the cell location will save time if the value in that cell changes. Say, for example, D10 represents your food budget for the week. This number is used several times, for instance, when it is then added to your other expenditures and then this sum is subtracted from your income. If you found you had missed a receipt, you would have to change all those numbers unless each time that number is used in your template it was identified by the cell location. If your design is set up with cell locations, you need to only change the number in D10, and the spreadsheet will automatically recalculate all the other figures based on the new value in D10.

Entering Value References — In the example above, we touched on value references. These entries will correspond to those cells in your design which contain the results of calculations. For example, cell D15 might contain the sum of cells through D14. Spreadsheets allow you to put in the formula instead of a number. In these formulas, you would refer to the cell location instead of the value in the cell for maximum flexibility. Thus, the sum for household expenditures in the Appleworks program would look like "@sum(D5. . D14)." Check your manual to see the exact method for inputting value references with your program.

Replicating Value References — One of the convenient things about spreadsheets is that they allow you to copy formulas. For example, you might want to sum all of the columns in your worksheet. Instead of entering the formula each time, you can ask the program to replicate the formula you entered in D15. Replication functions allow you to copy the formula (value or label for that matter) exactly or to relate it to the column where you are working. To replicate a formula, you must select that option or activity. The program will then ask what it is you want replicated. Often it will ask for the SOURCE. Depending on the program, you can select the source by where the cursor is or by entering the cell location. Next it will ask you where you want the formula to go. Usually it will ask for the TARGET. Again, generally you can select the target through keying in a response or moving the cursor. The program will then want to know the RANGE. That is, in how many cells and in what direction should the computer enter this formula? Select the end cell of the row or column in which you want the formula found. Finally, the computer will ask if you want the formula copied exactly. Usually this option is NO CHANGE, or if you want it changed to represent the values in each column or row, usually it is RELATIVE. You must select the appropriate response for each of the values or cell locations in the formula. Try this out several times to get a feel for how this function works in your program. In addition to summing and averaging numbers, the manual will list a variety of other functions you can take advantage of.

Working with Your Template

Spreadsheets have several other commands and options that can be useful. Generally, these commands are some variation on the following:

GOTO — Most spreadsheets have a command that will take you to any location in the spreadsheet you want.

Insert — Most spreadsheets allow you to insert rows or columns.

Window — The window in a template is the part of the spreadsheet you see on screen. Some programs allow you to look at several windows at once.

Layout — Most programs have several commands that allow you to change or manipulate format. Some allow you to vary the column width. Some make it possible to keep your label's column on screen. In addition to these functions, many programs also allow you to change the type of number to dollars, integers, or other options. In order to become familiar with these aspects of the program, try each one out to see what it does.

Storing and Printing Your Template

Once you have entered your information in a format that presents the information in a useful manner, and you make the calculations necessary to answer your questions, you need a method for storing that information and printing it onto hard copy. Check the manual or with your instructor to find out how your program performs these functions.

Worksheet

Monthly Family Budget Worksheet Spreadsheet Template

A	B	C	D	E	F
1	Expenditures	% budgeted	% expended		Difference
2	Lodging (incl. insurance)	20			$(D2/100 * D12) - E2$
3	Food	20			$(D3/100 * D12) - E3$
4	Clothing	10			$(D4/100 * D12) - E4$
5	Transportation (incl. fees, license, and insurance)*	10			$(D5/100 * D12) - E5$
6	Medical	5			$(D6/100 * D12) - E6$
7	Educational	10			$(D8/100 * D12) - E7$
8	Recreation	5			$(D8/100 * D12) - E8$
9	Savings	10			$(D9/100 * D12) - E9$
10	Entertainment	5			$(D10/100 * D12) - E10$
11	Other	5			$(D11/100 * D12) - E11$
12	Total Expenditures			@SUM(D2...D11)	$(D12/100 * D12) - E12$
14	Income				
15	Wages/Salaries				
16	Interest				
17	Business Profits				
18	Other				
20	Total Income				
		@SUM(D14...D18)			
21	Total income—expenditures				
		+ D20-E12			

*Transportation (including operation and repair of vehicle, public transportation, insurance and licenses).

SPREADSHEET WORKSHEET

List the commands for the spreadsheet you are using for each of the functions below.

Delete characters:

Insert characters:

Replicate values or labels:

GOTO a specific cell:

Insert columns or rows:

Delete columns or rows:

Change column width:

Move characters or cells:

Make windows:

Change layout to dollars and cents format or set standard values:

Fix columns or rows:

Print spreadsheet:

Save template:

Load template:

Find values:

Change layout:

Calculate values:

Arrange or sort a column:

Enter a value:

Enter a label:

SPREADSHEET USES

List below the names of people you know and some possible uses they would have for a spreadsheet.

	Person	Spreadsheet use
Home:	example. mother	checkbook record
Work:	example. salesperson	commission record
Other:	example. brother	baseball statistics for school

LOAN AMORTIZATION ANALYSIS

AMOUNT FINANCED	\$1,000.00	INTEREST 1ST YEAR	\$116.78
ANNUAL INTEREST %	12	INTEREST 2ND YEAR	80.25
TERM IN YEARS	4	INTEREST 3RD YEAR	50.35
MO. LOAN PAYMENT	\$ 26.33	INTEREST 4TH YEAR	16.65
ANNUAL LN. PMT.	\$ 316.01	INTEREST 5TH YEAR	(17.97)
TOTAL LOAN PMT.	\$1,264.02		

END OF MONTH	INTEREST PAID	PRINCIPAL PAID	PRINCIPAL REMAINING
1	\$10.00	\$16.33	\$983.67
2	9.84	16.50	967.17
3	9.67	16.66	950.51
4	9.51	16.83	933.68
5	9.34	17.00	916.68
6	9.17	17.17	899.51
7	9.00	17.34	882.18
8	8.82	17.51	864.66
9	8.65	17.69	864.98
10	8.47	17.86	829.11
11	8.29	18.04	811.07
12	8.11	18.22	792.85
13	7.93	18.41	774.44
14	7.74	18.59	755.85
15	7.56	18.78	737.08
16	7.37	18.96	718.11
17	7.18	19.15	698.96
18	6.99	19.34	679.62
19	6.80	19.54	660.08
20	6.60	19.73	640.35
21	6.40	19.93	620.41
22	6.20	20.13	600.29
23	6.00	20.33	579.95
24	5.80	20.53	559.42
25	5.59	20.74	538.68
26	5.39	20.95	517.73
27	5.18	21.16	496.58
28	4.97	21.37	475.21
29	4.75	21.58	435.63
30	4.54	21.80	431.83
31	4.32	22.02	409.81
32	4.10	22.24	387.58
33	3.88	22.46	365.12
34	3.65	22.68	342.44

35	3.42	22.91	319.53
36	3.20	23.14	296.39
37	2.96	23.37	273.02
38	2.73	23.60	249.42
39	2.49	23.84	225.58
40	2.26	24.08	201.50
41	2.01	24.32	177.18
42	1.77	24.56	152.62
43	1.53	24.81	127.81
44	1.28	25.06	102.75
45	1.03	25.31	77.45
46	.77	25.56	51.89
47	.52	25.81	26.07
48	.26	26.07	.00

With Appleworks, you must recalculate (open Apple K) until you get a 0 value in column D at the end of the loan period, in this case 48.

LOAN AMORTIZATION ANALYSIS

AMOUNT FINANCED	1000	INTEREST 1ST YEAR	@SUM(B13...B25)
ANNUAL INTEREST %	12	INTEREST 2ND YEAR	@SUM(B26...B37)
TERM IN YEARS	4	INTEREST 3RD YEAR	@SUM(B38...B49)
MO. LOAN PAYMENT	*	INTEREST 4TH YEAR	@SUM(B50...B61)
ANNUAL LOAN PMT.	@SUM(B6*B12)	INTEREST 5TH YEAR	@SUM(B62...B73)
TOTAL LOAN PMT.	@SUM(B7*B5)		

END OF MONTH	INTEREST PAID	PRINCIPAL PAID	PRINCIPAL REMAINING
1	@SUM(B3*B4)/100/12	@SUM(B6-B13)	@SUM(B3-C13)
@SUM(A13+1)	@SUM(D13*B4)/100/12	@SUM(B6-B14)	@SUM(D13-C14)
@SUM(A14+1)	@SUM(D14*B4)/100/12	@SUM(B6-B15)	@SUM(D14-C15)
@SUM(A15+1)	@SUM(D15*B4)/100/12	@SUM(B6-B16)	@SUM(D15-C16)
@SUM(A16+1)	@SUM(D16*B4)/100/12	@SUM(B6-B17)	@SUM(D16-C17)
@SUM(A17+1)	@SUM(D17*B4)/100/12	@SUM(B6-B18)	@SUM(D17-C18)
@SUM(A18+1)	@SUM(D18*B4)/100/12	@SUM(B6-B19)	@SUM(D18-C19)
@SUM(A19+1)	@SUM(D19*B4)/100/12	@SUM(B6-B20)	@SUM(D19-C20)
@SUM(A20+1)	@SUM(D20*B4)/100/12	@SUM(B6-B21)	@SUM(D20-C21)
@SUM(A21+1)	@SUM(D21*B4)/100/12	@SUM(B6-B22)	@SUM(D21-C22)
@SUM(A22+1)	@SUM(D22*B4)/100/12	@SUM(B6-B23)	@SUM(D22-C23)
@SUM(A23+1)	@SUM(D23*B4)/100/12	@SUM(B6-B24)	@SUM(D23-C24)
@SUM(A24+1)	@SUM(D24*B4)/100/12	@SUM(B6-B25)	@SUM(D24-C25)
@SUM(A25+1)	@SUM(D25*B4)/100/12	@SUM(B6-B26)	@SUM(D25-C26)
@SUM(A26+1)	@SUM(D26*B4)/100/12	@SUM(B6-B27)	@SUM(D26-C27)
@SUM(A27+1)	@SUM(D27*B4)/100/12	@SUM(B6-B28)	@SUM(D27-C28)
@SUM(A28+1)	@SUM(D28*B4)/100/12	@SUM(B6-B29)	@SUM(D28-C29)
@SUM(A29+1)	@SUM(D29*B4)/100/12	@SUM(B6-B30)	@SUM(D29-C30)
@SUM(A30+1)	@SUM(D30*B4)/100/12	@SUM(B6-B31)	@SUM(D30-C31)
@SUM(A31+1)	@SUM(D31*B4)/100/12	@SUM(B6-B32)	@SUM(D31-C32)
@SUM(A32+1)	@SUM(D32*B4)/100/12	@SUM(B6-B33)	@SUM(D32-C33)
@SUM(A33+1)	@SUM(D33*B4)/100/12	@SUM(B6-B34)	@SUM(D33-C34)
@SUM(A34+1)	@SUM(D34*B4)/100/12	@SUM(B6-B35)	@SUM(D34-C35)
@SUM(A35+1)	@SUM(D35*B4)/100/12	@SUM(B6-B36)	@SUM(D35-C36)
@SUM(A36+1)	@SUM(D36*B4)/100/12	@SUM(B6-B37)	@SUM(D36-C37)
@SUM(A37+1)	@SUM(D37*B4)/100/12	@SUM(B6-B38)	@SUM(D37-C38)
@SUM(A38+1)	@SUM(D38*B4)/100/12	@SUM(B6-B39)	@SUM(D38-C39)
@SUM(A39+1)	@SUM(D39*B4)/100/12	@SUM(B6-B40)	@SUM(D39-C40)
@SUM(A40+1)	@SUM(D40*B4)/100/12	@SUM(B6-B41)	@SUM(D40-C41)
@SUM(A41+1)	@SUM(D41*B4)/100/12	@SUM(B6-B42)	@SUM(D41-C42)
@SUM(A42+1)	@SUM(D42*B4)/100/12	@SUM(B6-B43)	@SUM(D42-C43)
@SUM(A43+1)	@SUM(D43*B4)/100/12	@SUM(B6-B44)	@SUM(D43-C44)
@SUM(A44+1)	@SUM(D44*B4)/100/12	@SUM(B6-B45)	@SUM(D44-C45)
@SUM(A45+1)	@SUM(D45*B4)/100/12	@SUM(B6-B46)	@SUM(D45-C46)
@SUM(A46+1)	@SUM(D46*B4)/100/12	@SUM(B6-B47)	@SUM(D46-C47)
@SUM(A47+1)	@SUM(D47*B4)/100/12	@SUM(B6-B48)	@SUM(D47-C48)
@SUM(A48+1)	@SUM(D48*B4)/100/12	@SUM(B6-B49)	@SUM(D48-C49)

MO. LOAN PAYMENT @SUM((B4/1200)*B3)/(1-(1+(B4/1200)))

USING A SPREADSHEET

	A	B	C	D	E	F
1	Expenditures		% budgeted		% expended	Difference
2	Lodging (incl. insurance)		20		_____	$(D2/100 \cdot D12) - E2$
3	Food		20		_____	$(D3/100 \cdot D12) - E3$
4	Clothing		10		_____	$(D4/100 \cdot D12) - E4$
5	Transportation (incl. fees, license, and insurance)*		10		_____	$(D5/100 \cdot D12) - E5$
6	Medical		5		_____	$(D6/100 \cdot D12) - E6$
7	Educational		10		_____	$(D8/100 \cdot D12) - E7$
8	Recreation		5		_____	$(D8/100 \cdot D12) - E8$
9	Savings		10		_____	$(D9/100 \cdot D12) - E9$
10	Entertainment		5		_____	$(D10/100 \cdot D12) - E10$
11	Other		5		_____	$(D11/100 \cdot D12) - E11$
12	Total Expenditures		_____		@SUM(D2...D11)	$(D12/100 \cdot D12) - E12$
14	Income		_____			
15	Wages/Salaries		_____			
16	Interest		_____			
17	Business Profits		_____			
18	Other		_____			
20	Total Income		_____			
			@SUM(D14...D18)			
21	Total income—expenditures		_____			
			+ D20-E12			

*Transportation (including operation and repair of vehicle, public transportation, insurance and licenses).

1. Which of the following cells are labels?

A4E4

E14

F18

2. Which of the following are values?

A5

F4

D10

E12

3. Where are the actual expenses for transportation located? _____

4. Which cell holds the value reference for the total of expenses? _____

5. What do each of the value references in F8 represent? _____

6. If a lost receipt for clothing was added now, what cells would change?

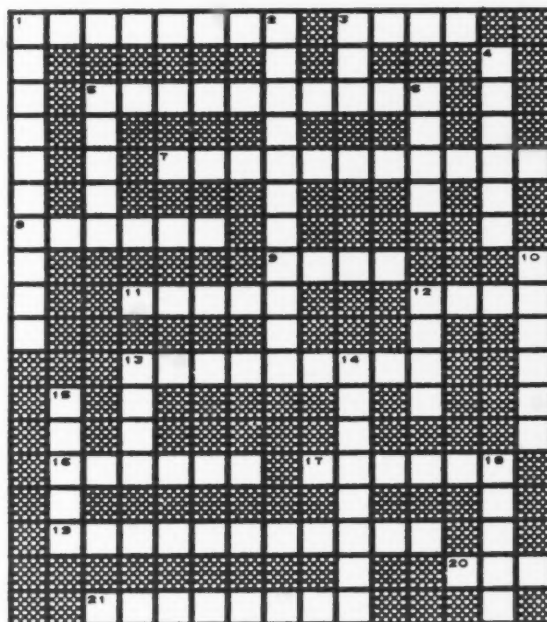
7. If cells D17 and D16 were changed to 2.5, how much more money would the family have for their vacation?

Across Clues

1. Value references.
3. List of options.
5. spreadsheet.
7. Electronic spreadsheets can do this easily.
8. Where the formula is to be moved.
9. Menu that aids you.
11. The number of cells to receive the value reference.
12. Information.
13. Special formulas.
16. Data to be calculated.
17. Necessary to safeguard your data.
19. Written instructions.
20. Implement for designing a template.
21. Your design.

Down Clues

1. Global or specific setting up.
2. Layout for accounting purposes.
3. Often courses are geared to them.
4. Scenarios you can try out.
5. How to get the information on screen.
6. Data are located by their.
10. Alphanumeric information.
12. Where you save your data.
13. What the instructions will do if the setup is not right.
14. What you need to do with your data before you enter it.
15. A template you can recall is one you have.
18. What you need to get started with your design.



Section IV

Log

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48

48

Section V

Introduction

Data Base Management Systems

For many of us, living in the Information Age has meant that we are often inundated with so much information that we can't use it. It is no surprise, then, that a growing field in Information Age technology is the development of computer programs to manage information. These data base management systems provide the user with the ability to organize, store, and retrieve information easily and effectively.

Despite the fact that data base management systems are an extremely useful computer application, until recently most of the packages were too cumbersome for many micro users to apply. Now that simple, easy-to-use software packages are available, many more users have entered the fascinating world of data base management. From recipe files and address lists to budgets, data bases are coming into their own as an important computer application for both home and business.

In this section you will have an opportunity to plan, design, and use a data base. In addition, you will learn something about the features that commonly come with a data base as well as the possible applications. Finally, you will get an opportunity to use the jargon associated with this important computer application. Specific objectives for this session are to:

- learn what data base management systems are and what they can do
- identify data base applications for your problem application
- develop the skills to plan and design a data base
- practice setting up a data base for your group's problem application
- know something about the data base features and be able to identify those features crucial to your application

Section V

Info Sheet

Data Base Management Systems

What Is a Data Base Management System?

What exactly is a DBMS? Simply put, a data base management system allows the user, you, to organize information (data) so that it can easily be used. Think about your household and the data you have to deal with — household inventory for tax purposes, all of those recipes crammed into a drawer or box, or even your Christmas card mailing list. Wouldn't it be wonderful to be able to find the particular recipe or address you need quickly and easily? A properly set up data base can do that for you.

But what exactly is a DBMS? A DBMS organizes DATA. What is DATA? DATA can be any form of information: numbers, statistics, formulas, letters, words or characters. The data you use in balancing your checkbook are the numbers that reflect the values of checks and deposits. The data in an address book include names, addresses, phones numbers, etc.

Data are organized into DATA BASES. A DATA BASE is a collection of information usually on one topic or subject. The contents of your file cabinet is a data base as is your address book or recipe file. Other examples are libraries, financial reports, and teachers' grade books.

Data bases, however, are useless unless there is a method for retrieving and using the information located in the data base. DATA BASE MANAGEMENT SYSTEMS provide the user with the tools or methods to locate, use, and store information. Examples of DATA BASE MANAGEMENT SYSTEMS you have used include the library system for locating books, either by call number or alphabetically, and files that are organized by one of several different methods including alphabetically, chronologically or by major categories.

Computers with DBMS software offer us a new tool to keep up with the vast amounts of information that pass our way. You are probably familiar with some computerized data bases already. The IRS, business payrolls, and bank machines are all examples of computerized data bases.

Data base Management Systems generally have several common features including the way information is organized or entered, search features, sorting routines, and, finally, mechanisms for storing and printing information. Just as designing the template is critical for developing an effective spreadsheet, designing your database will determine how well a DBMS will work for your application.

What Can a DBMS Do for Me?

Some of the common uses around the household for a DBMS are:

- recipe files
- list of possessions for insurance
- records of collections
- address list or mailing list

Some of the common business applications are:

- customer or client files
- inventories
- resource lists
- suppliers' names
- mailing lists

How Do DBMSs Differ?

There are several types of DBMS programs. One key difference among them is whether the program can handle numeric as well as alphanumeric information. A second difference is the way the system handles files. A DATA MANAGER program will only work with one file at a time, while a relational data base can work with one or more related files allowing you to access information across files. With such a program, it would be possible to access information from your address list to add to a file with clients' orders.

A final consideration in reviewing data bases involves the level of sophistication. DBMSs vary from simple mailing list programs to complicated relational programs such as Condor and DATA BASE II. Researching the user friendliness of the program and the level of sophistication you are comfortable with can mean the difference between a program gathering dust on the shelf and a program that contributes to your management capabilities.

A number of software firms have recently marketed new DBMS programs for microcomputers. While most programs provide the user with the ability to store, save, search, sort, and print, there are many added features that may be of use to you including:

- Size of program.
- Application to specific computer.
- Memory.
- Ease of changing names or categories.
- Production of reports, labels, or both.
- File management — How easy is it to merge files, make new ones, etc?
- Menu driven — Can you select options off a menu or do you have to memorize commands?
- Query function — How easy is it to tell the computer what you want done.

Does it have an ad hoc query capability to allow you to access any piece of information anywhere in the file?

- Screen generator — Can you arrange the screen to meet your needs? Does it have a password function to protect your information from others?
- Batch processing — Does it automatically perform some functions?
- Is it programmable?
- Most DBMS programs involve complicated loops in the programming. Can you get out of a loop easily?
- How sophisticated is the indexing, search, or sort capability?
- Can you move the information to other programs or extract from other files (data import, data export)?
- Does it have graphics capability?

Section V

Info Sheet

Working with a Data Base Management Program

Designing a Data Base

As with other software applications, the first step is to use pencil and paper to do some planning. Earlier in the course, we talked about the importance of the user's management skills in developing a successful application. Clearly, one of the critical skills is that of organization. Use the problem-solving process described earlier to organize your DBMS template so it performs the tasks you need.

The first step is, of course, to identify the needs that your DBMS template will address. What do you want to do with the information? How will you use it (for example, mailing list of club members, list of household possessions for insurance purposes, references to recipes by major ingredients)? In computer language, what outputs do you want? I will use this data base program to:

- a. _____
- b. _____
- c. _____
- d. _____

Next, you will need to research the information. In order to organize the results of your search, you will need to know what types of information you are looking for and how that information will be used. In other words, what inputs will the DBMS need to give you the outputs you want. Working out this part of the process is the most important and often the most problematic part of setting up a data base. There are actually several questions to be resolved here.

What is the subject or topic of the data base you want to computerize? FILE is the term most often used to describe a particular data base. Your data disk may store several different FILES, perhaps one on recipes, one on financial records, an address list, possibly a list of all the items in a collection of cards, books, coins, etc.

The topic or subject of my file will be: _____

Once you have established your topic, you will need to think of all the possible pieces of information that will go into your data base. The first item to consider is the subject of your RECORD or entry category. If you think of your data base as a record collection, one record would contain all the songs on a record. If you think of your data base as an address book, your records would contain all the information on one person.

The records in my file will contain information on _____

Now that you have established the subject of each individual record, you will need to make a list of all the **FIELDS** or **CATEGORIES** of information you want to collect for each record. In the example of an address book, categories or fields would include name (first and last if you want to sort by last name), address, city, zip, phone, possibly the company the person works for or the name of the person who introduced you. Depending on how your program works, you may want to add a category just in case you find you need more room later. I will need _____ categories or fields. They are:

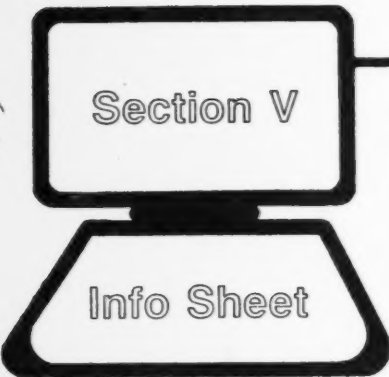
- a. _____
- b. _____
- c. _____
- d. _____
- e. _____
- f. _____
- g. _____

Some programs, such as Visifile, will ask you to provide more information on the fields, i.e., the number of characters, whether the data are numeric or alphanumeric, etc.

Some DBMS programs allow you to enter certain types of numeric values that can be computed in the report format, e.g., list of customers with amounts owed. If your program uses both, what information would you want calculated and how?

The information I want calculated is:

Before you design your fields and categories, it is important to refer to your list of things you want to do with the data base. If, for example, you want to sort by zip code, but you have collapsed that category with city, the computer will probably be unable to find zip to do the sorting. Check your design before entering information to see if you have categories to match all the ways you think you will want to use the information. While some programs allow you to make changes in the design of your data base, some do not. With other programs it is a complicated task. It is worth your time to think the design through very carefully before working with the program.



Section V

Info Sheet

Using a Data Base Management Program

The great value of data bases is that they help you get the information you need, in the form you need it, when you need it. Data bases allow you to access and retrieve information quickly and easily. Generally they do this by **SEARCHing** for a particular value or field. Some programs have a **FIND** function that allows you to enter in any piece of information and ask the computer to find the record(s) that contain a match. The **SEARCH**, **SELECT** or **FIND** functions are helpful if, for example, you want to look up a particular phone number, recipe ingredient, or book title.

In addition to retrieving information, a **DBMS** also helps you organize your information. The computer can **SORT** or **ARRANGE** the information for you. If, for example, you want a mailing list, you might have it sort by zip code. Or, if you want a bibliography, you might have it sort by author's last name.

Finally, once you have the information selected and arranged to meet your needs, you will need to tell the computer how to **PRESENT** the information. Generally, there are two formats available for **PRINTing** the information out: the **REPORT** format and the **LABEL** format. After you have selected the format, the computer will organize the data to meet your needs and print it out. When you have done all this work, the program will provide you with a means to **SAVE** what you have done. With **DBMS's** this can sometimes be tricky because, if the last thing you did was a search or find, the computer may not save the whole file, but only the part for which it searched unless you go back into the whole file. For many of us, using a data base requires a little work. Once you have learned to apply a **DBMS**, however, it opens many doors to easier and more effective information management.

Section V

Info Sheet

Buzzwords for Data Bases*

Data Base — a collection of information that will be viewed or printed. Data bases are similar to filing systems. They are used so that the information they contain can be recalled for future use. An example of a database is the records kept by a fertilizer company or the records kept by the IRS.

Records — the information about a single item or entity. In the case of the fertilizer company, a record would be the information about a client.

Field — any piece of information within a record. In a class roster file, an example of a field would be your name.

File — a collection of records. So, for an example, a file could contain the records for the clients of the fertilizer company. Each file will probably contain several records, and each record will probably contain several fields.

Search — the ability to find information from within the data base. An example would be to search for all of the people who still owe money to the IRS for 1982. Another example would be to find all of the information that the IRS has on an individual.

Sort — to rearrange the records in a data base into an order that is different from the order in which the records were entered. An example would be to alphabetize a list of names and addresses. Another example would be to rearrange the records of the fertilizer company in such a way that the person who owes the most amount of money is on the top of the list, and the person that owes the least is on the bottom of the list.

Section V

Worksheet

Data Base Search

1. Information that comes in letters, numbers and symbols.
2. A collection of information.
3. The act of controlling information.
4. The method for controlling information.
5. Shop talk.
6. Information about a single item.
7. Any piece of information within a record.
8. A collection of records.
9. Ability to find information.
10. To rearrange the order of records.

HPQQUJELHCTI
JBXWRXDDOUYU
OSTEKRKRRSZT
IBENGWEIOQKR
NDQSEFRCNCLO
JLDHAMVFILES
AEACCBECAMMR
RITFPRAGYRSA
GFAHAYATASVH
OCLQYBSEANJQ
NLCWFILESDAH
NDQCLMETSYSM

- Developed by Jacie Jensen, former Extension computer specialist, University of Idaho, Moscow.

PROBLEM SOLVING WITH A DATA BASE*

The data base can be a very useful tool for problem solving. Some of the ways this tool can be applied are:

DISCOVERING COMMONALITIES AND DIFFERENCES

The sort/arrange and find functions allow the user to look at the commonalities and differences among events, groups, or things. We could, for example, look at all the jobs that pay minimum wage to see what they have in common.

ANALYZING RELATIONSHIPS

With a data base program, the user can call up all the entries in a file with a particular characteristic and then check to see if the records in that file share other characteristics. With a job classification file, we could look up all the jobs that require a high school education. Do those jobs share other characteristics?

LOOKING FOR TRENDS

Data base managers allow us to set up the data in easy to use formats. A file containing historical information, such as the population of a certain county for example, can be reported so that trends in population are easy to identify.

TESTING AND REFINING THEORIES

With a data base file, we could examine the theory that low-paying jobs are most often associated with lower levels of educational achievement by listing the low-paying jobs, the jobs that require minimum levels of education, and jobs that are both low paying and require low levels of education and comparing the lists.

ORGANIZING AND SHARING DATA

Data base programs provide a means for people to use each other's research. For example, if a group wanted to put together a tourist guide to their area, each person working on the project could enter their information into a common database file. All of the information for the area would then be in one location and could be used by anyone with a need to use it.

KEEPING INFORMATION UP TO DATE

Database files can be updated anytime the information changes. For example, if someone in the class moves, their old address is easily replaced with the new one. If someone in the tourist file changes their rates, that too can be easily changed without having to retype the entire listing.

ARRANGE INFORMATION

The reporting out features of a data base combined with the arrange and sort functions make it easy to format data for any purpose. The class list could be arranged by address or alphabetically by name. The tourist's guide could be arranged by type of activity, location, or price range.

-
- This information is adapted from an article by Beverly Hunter in the May 1985 issue of the THE COMPUTING TEACHER, pages 20-27.

DATA BASE USES

Use the table below to list people you know and possible uses they might make of a database.

	Person	Data base Use
Home	example. Sister	Record collection
Work	example. Boss	Inventory record
Other	example. Neighbor	Coin collection
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

DATA BASE WORKSHEET

Based on the data base manager you are using, list the commands for each of the functions below:

Delete characters:

Insert characters:

GOTO a specific record:

Sort or arrange files:

Delete records:

Name a file:

Make windows:

Print labels:

Print reports:

Calculate values:

Delete categories:

Insert categories:

Find a specific text:

Enter a category:

Insert or enter records:

Begin a file:

Set up categories:

Copy records:

Save template:

Load template:

Find totals:

SCREENS FOR APPLEWORKS DATA MANAGER

DESIGNING A TEMPLATE

CHANGE NAME/CATEGORY

File: Tourist
Category Names

Escape: Erase entry

TYPE OF ATTRACTION
NAME
LOCATION
PRICE RANGE
DESCRIPTION
SEASONAL
OTHER INFORMATION

Options:

Type category name
Up arrow
Go to previous category

Type entry or use @ commands

25K Available

Entering Data

REVIEW/ADD/CHANGE

File: Tourist

Escape: Main Menu

Selection: All records

Record 3 of 7

TYPE OF ATTRACTION: Lodging NAME: Big House Bed and Breakfast
LOCATION: 4th and Ash
PRICE RANGE: \$15 single and \$25 double
DESCRIPTION: Clean and friendly
SEASONAL: Closed November to May

Type entry or use @ commands

@ - ? for Help

Below is an example of a template for developing a tourist guide to a local area.
A sample of what entries might look like follows:

File: Tourist

Page 1

Report: Local Attraction

Restaurant

Lou's Cafe
5th and Main
Very reasonable
Family cafe
No

Restaurant

The Steak House
South Highway
Moderate to high
Good dinners
No

Lodging

Big House Bed and Breakfast
4th and Ash
\$15 single, \$25 double
Clean and friendly
Closed November to May

Lodging

Best Western
Main and Center
\$35 single, \$45 double
Good
No

Recreation

Big Hill Sky Resort
South Highway
\$15 day pass
Good hills
Winter

Recreation

Fishing on the South Fork
Along South Highway
Fishing supplies
Nice trout, some bass
May to September

Recreation

South River Museum
Main St.
Donation
Very interesting, early history
No

PROBLEM SOLVING WITH A DATABASE

AN EXAMPLE

Suppose you are newly elected to the city council. At the first meeting the council is discussing what project will have priority for the year. Suggestions include:

1. community beautification
2. small business development
3. improving community recreation opportunities.
4. marketing the local tourist attractions
5. improving educational opportunities
6. increasing attention to community history and pride

You are interested in what the community thinks about these different projects, and you decide to interview some people about their ideas. In order to assure confidentiality, you assign each person a number and rank order their preferences, 1 for top priority and 6 for the last priority. To tabulate your results, you decide to use a data base.

Instructions:

Interview respondents and record their priorities.

Set up a data base to handle the information.

Enter the data and prepare a report to the council.

Sample Report:

Report: priorities

A = Small business development

B = Community beautification

C = Tourism

D = Improving education

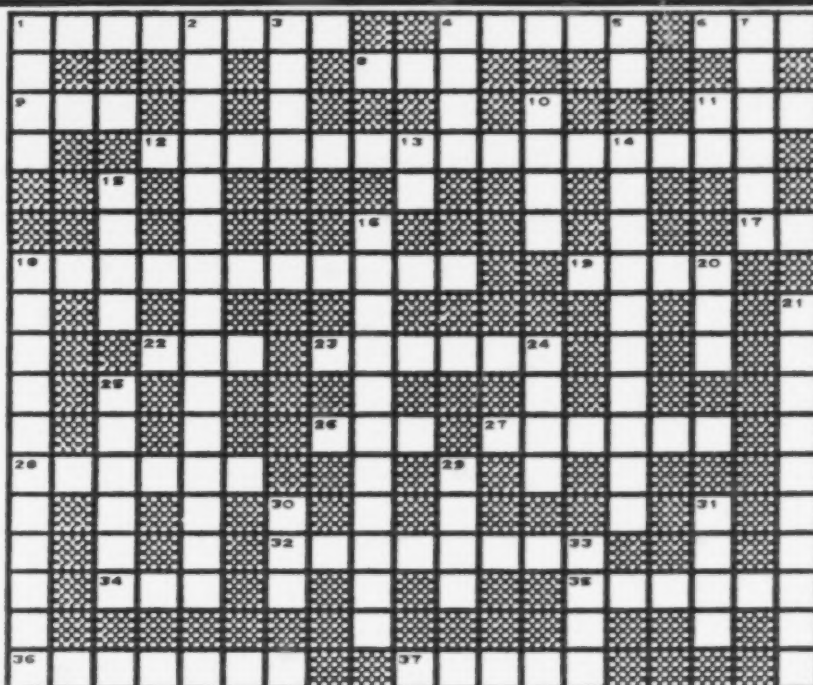
E = Community pride and history

F = Recreation

Interviewee	A	B	C	D	E	F
1	1	6	3	4	5	2
2	1	2	3	4	5	6
3	6	5	4	3	2	1
4	1	3	5	6	4	2
5	2	3	4	5	6	1
6	2	4	1	3	5	6
7	3	5	1	2	4	6
8	5	3	1	6	4	2
Totals*	21*	31*	22*	33*	35*	26*

INVENTORY EXAMPLE

ITEM NO.	DESCRIPTION	UNIT COST	QUANTITY	TOTAL COST
324	Nails, 10pe	.35	120	42.00
201	Nails, finis	.25	100	25.00
201	Hammer, fini	5.24	100	524.00
216	Screwdriver	1.56	200	312.00
654	Hoe, garden	18.67	45	840.15
187	Hose, garden	10.67	20	213.40
256	Rake, garden	14.67	34	498.78
345	Rake, lawn	12.45	43	535.35
305	Screwdriver	3.24	67	217.08
101	Hammer, roug	3.39	55	186.45
668	shovel, squa	6.89	50	<u>344.50</u>
				3738.71*



Across Clues

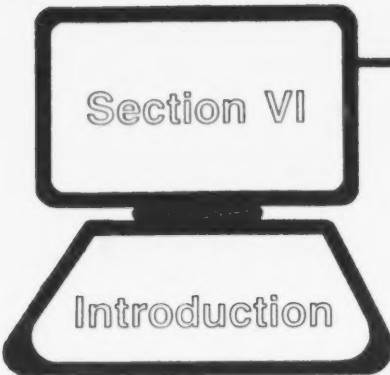
1. Collection of information.
4. One item of information in your entry or record.
6. Some programs let you use this key to get out.
8. Computer assisted instruction.
9. I get _____ when it doesn't give me what I want.
11. Color.
12. Utility that allows you to create customized screens.
17. Type of computer.
18. New age in American industry.
19. What the program does to arrange the information for me.
22. What a person must do to get started.
23. A group of entries treated as one unit.
26. Random Access Memory.
27. Many DBMS programs can generate these.
28. A good DBMS lets you _____ the information you need now.
32. DBMS do this for your files.
34. Subject of some farmer's data base.
35. The key first step in working with a data base management system.
36. How the information is entered.
37. Dumping the data base onto hard copy.

Down Clues

1. Term for moving data.
2. Processing information automatically.
3. If you don't, you'll be sorry.
4. Collection of records.
5. Short for data base.
7. What the program does to find a particular piece of information for me.
10. Type of data base that does not allow interaction among files.
11. Prep.
13. Some programs tell you to do this.
14. Feature which allows you to call up data from anywhere in the file.
15. Short for information.
16. Type of program.
18. Allows user to customize.
20. 10.
21. Type of data base that allows interaction among files.
24. What the mouse does in MacPaint.
25. If you don't, you will be sorry.
29. Information on options.
30. Disk Operating System.
31. Short for initialize.
33. Key feature in any program.

Section V

Log



Section VI

Introduction

Computers and Communications

One of the most rapidly growing computer applications involves electronic communications. With advances in technology, more and more people are able to use their computer and their phone line or satellite dish to do a number of different tasks. For example, in some areas customers can pay their bills, order materials, or transfer money via their computer connection. Electronic networks also provide access to resources, new information, people to chat with, as well as financial news. For example, farmers can find out what the grain market is doing or which new pesticide has the most effective test result. Network CBers gather from all over the country to share information and tell yarns. Rap groups meet to discuss common concerns and problems. In addition, electronic bulletin boards provide a speedy way of making announcements, making requests or soliciting advice. In short, electronic communications can bring almost any aspect of modern life into your computer room regardless of where you live. Rural isolation and road problems are no barriers to taking your ideas and questions anywhere you wish.

This section is designed to acquaint you with some of the possibilities of electronic communications and to think of some potential applications related to your problem scenario. Specifically, you will:

- view the wide variety of networks available
- identify applications for electronic networks
- discuss the implications of electronic communications

Section VI

Log

NEXT STEPS

In this last section of Unit II of the READI course, you will have an opportunity to think about what opportunities you want to take advantage of next. Since not everyone has the same goals for working with computers, and not everyone has access to the same information about resources and opportunities, we hope you will take some time in the class to talk about next steps. For some of you this may mean purchasing a computer, while for others it may mean taking additional courses or workshops. Still, for other class members, the next step might be to get more involved in decisions about how computers will be used in the school system. Whatever your goals, this section will focus on locating resources and information to help you with your future plans. Specifically this last section will focus on:

- Accessing the referral information developed by the READI advisory committee.
- Using the decision making process to consider next steps and
- Discussing the future role of computers in your life.

What One Person Can Do

One person can:

1. Buy a computer.
2. Investigate new technology by taking a class through vocational extension, continuing education or community education.
3. Read a book on computers.
4. Order a magazine subscription on computers.
5. Attend a workshop on computers through cooperative extension or another organization.
6. Visit some computer stores.
7. Volunteer for a 4-H or school computer program.
8. Bring a speaker, film or slide show on computers to one of the groups you belong to.
9. Talk with someone who works with computers about their job.
10. Become a READI Instructor.

What Can a Group Do?

A group of people can:

1. Organize a class through vocational extension, community education or continuing education.
2. Organize a users' group to meet regularly and share ideas and information.
3. Plan a computer expo in your community to acquaint others with information about computers.
4. Invite a speaker or panel to talk about computer on the job.
5. Borrow videos, films or slide shows on computers to show.
6. Develop a community computer center.

Section VII

Worksheet

FUTURING

1. Imagine yourself 5 years from now. How will you be using computers? What role will they play in your life? When you think about these questions, what images or pictures come to mind?

2. Based on the way you visualize yourself in the future, what one or two specific things do you want to be doing then that you aren't doing now? List these one or two things as goals.

A. _____

B. _____

C. _____

3. For each goal, write a sentence about how to get started working on that goal.

A. _____

B. _____

C. _____

4. Is there anything you can do to help you reach those goals before tomorrow?

A. _____

B. _____

C. _____

5. What can you realistically expect to have accomplished one week from today?

A. _____

B. _____

C. _____

6. What, specifically, can you do within 1 month to implement your goals?

A. _____

B. _____

C. _____

8. Things to think about:

- Are the goals consistent with your personal characteristics, abilities and opportunities?

- What is the relationship between your long range and short range goals?

- What kinds of time considerations must you work within?

Incorporating New Technology Into Life/Work Planning

Life/work planning activities have been included in the READI curriculum for several reasons. On the one hand, the rapidly changing nature of the labor force means that most people will have more than one career and that many others will change jobs frequently. Skills in evaluating previous experiences, setting new goals and accessing resources are more important than ever before.

On the other hand, one reason why information presented in classes is not retained by students is because they can often neither apply the information to their lives nor concretely see its relevance in their future. Therefore, the READI project has provided several activities to help you focus on the role of computers in both your future and that of your community.

Although computers are new to many areas of Idaho, they have already affected many people's lives. Some people have lost jobs, others have developed new careers, and still others have streamlined their everyday tasks. Computers, therefore, have come to represent change to many people.

The READI curriculum represents a response to the changes computers are making in our lives. Life/work planning can also be an important method of responding to change. But, according to Bolles (author of several books on life/work planning), effective planning for the future is based on both change and constancy. By thinking about life/work planning in a class on computer literacy, we hope to help you plan for the new while maintaining what is important to you now. The challenge, then, for READI has been to present new technology without threatening important parts of our lives as we now live them.

New technology can be incorporated successfully into our planning for the future if its potential impact on relationships, work, and school is considered within the context of what we value most about our lives. Planning that recognizes change but also stability and values, empowers individuals to more actively control their future. Several activities to help with that planning include:

Skill Assessment?

A variety of materials and resources exist to help people examine the skills they have now as a way to plan for reentering the job market or changing careers. The basic idea behind skill assessment is that the focus on jobs and job titles often obscures our ability to identify actual skills.

Everyone has a number of skills, and those skills are transferable to other jobs or activities. For example, there are a number of skills involved in planting a garden or taking care of children. Also, several successful small business owners have successfully transferred skills such as those used in taking care of children into a service they can market. Skill assessment is, thus an important step in the process of life/work planning.

While your READI classes may not be the appropriate place for skill assessment, you will recognize many skills which you can easily transfer to computer related work.

Futuring? — Futuring exercises are those that begin by asking the person to envision the future in relation to the topic at hand. We suggest that you envision yourself using a computer in 1 to 5 years, at home or at work. By beginning with a focus on the successful attainment of the goal, this exercise helps people avoid falling into negative thinking — i.e. all the reasons why they couldn't succeed at what they want to do.

Goal Setting? — Once you have an idea about what direction your plans for the future will take you, goal setting involves putting this information down in writing as a goal statement — such as, in the coming year I want to take a workshop on electronic spreadsheets and use my new skills to put my budget on the computer. Usually by the end of the futuring activity everyone has good ideas of what their goals will be and can write them down.

Developing a Plan? — Once the overall goal is set, it is time to concentrate on strategies for reaching that goal. The force field analysis in which you list the forces that will hinder you in reaching your goal as well as those that will help you reach your goal can be an important tool in this process. Based on the information generated in the force field exercise, you can develop short range goals as a guide to the successful completion of your long range goals. In setting these goals, it is important to develop a goal that can be accomplished in the immediate future, this week or tomorrow. You can also work in small groups to suggest resources for overcoming each others' hindrances and barriers.

For more information on life/work planning, check with your local job service, college, high school guidance counselor, library or bookstore.

Section VII

Worksheet

Computer Software Needs Survey*

This survey is designed to help you determine your home or home-based business computer needs.

Yes No

- | | | |
|-------|-------|--|
| _____ | _____ | 1. Do you have children in school? |
| _____ | _____ | 2. Would your children benefit from having access to a computer? |
| _____ | _____ | 3. Do you help your children with their homework? |
| _____ | _____ | 4. Do you, or your children, do lots of reports? |
| _____ | _____ | 5. Do you plan family leisure activities to be centered around the home? |
| _____ | _____ | 6. Do you and other family members play video games? |
| _____ | _____ | 7. Do you see a computer as an investment in your children's future. |
| _____ | _____ | 8. Are you, or any other family member, specifically interested in history, art or music? |
| _____ | _____ | 9. Do you have lots of newspapers and magazine subscriptions but only read selected parts of them? |
| _____ | _____ | 10. Have you, or any other family members, taken a class in computer literacy? |
| _____ | _____ | 11. Do you, or any family members, wish to explore computer programming as a possible career? |
| _____ | _____ | 12. Do you want to explore the possibility of doing word processing for a company at home? |
| _____ | _____ | 13. Do you write at home — letters, reports, poetry, short stories or news articles? |
| _____ | _____ | 14. Do you keep lists? For example, Christmas cards, a volunteer organization's membership or herd reproduction records? |
| _____ | _____ | 15. Do you do bookkeeping or typing tasks at home? |
| _____ | _____ | 16. Do you want to take on additional bookkeeping or typing jobs? |
| _____ | _____ | 17. Do you want to be able to be in contact with others who use the computer in the same way you do? |
| _____ | _____ | 18. Do you often do financial analysis at home for yourself or your home based business? |
| _____ | _____ | 19. Would you like to be able to analyze and study financial alternatives at home, i.e. buying real estate, selling wheat or reviewing up-to-the-minute financial reports? |

- _____ 20. Could you use the computer to organize your home, finances, time or records?
- _____ 21. Do you want to do more shopping or price comparisons at home?
- _____ 22. Does your computer have the capacity to run the software you are interested in using?
- _____ 23. If necessary to buy additional equipment to run the software you want, have you investigated the cost?
- _____ 24. Would you be willing to pay the extra cost for graphics, color or sound?
- _____ 25. Is there a reliable service and support center near to help you with your computer needs?

The following scale will help you determine the area of interest you will want to explore when purchasing a computer or software:

- If you answered yes to any or all of questions 1, 5, 6, 8, 17 or 24, your computer interests are oriented toward **Entertainment?**
- If you answered yes to any or all of questions 3, 4, 5, 9, 13, 14, 20, 21, 22, 23 or 24, your interests are oriented toward **Home Management**.
- If you answered yes to any or all of questions 15, 18, 19, 20, 21 or 24, your interests are oriented toward **Financial Management**.
- If you answered yes to any or all of questions 1, 2, 3, 4, 7, 8, 10, 11, 22, 23 or 24, your interests are oriented toward **Education**.
- If you answered yes to any or all of questions 13, 14, 15, 16, 18, 19, 22 or 23, your interests are oriented toward a **Database of Home Based Business**.
- If you answered yes to any or all of questions 4, 12, 13, 15 or 16, your interests are oriented toward **Word Processing**.
- If you answered yes to questions 8, 17, or 19, your interests are oriented toward **Networking**.
- If you answered yes to questions 22, 23, 24 or 25, you are aware of the need to compare computer hardware and software options and to find a reliable dealer.

*Prepared by Joan Parr, Extension Home Economist, Cassia County, Burley, Idaho



SAMPLE PROJECT APPLICATIONS

DECISION/PROBLEMS WORD PROCESSING

Family Budgets

How to save money for _____.

Family financial plan

How to save money on interest?

Retirement Plans

How can we plan for the future?

Retirement plan

How can we increase our investment income?

Users' Group

How to get people involved?

Flyer, news release

How do we organize it?

Plan of action

Who will get involved?

What resources will we offer?

Job Search

How can I sell myself? Resume, Application Letter

How will I get by between jobs?

How can I learn about potential jobs?

Small Business

How can I get started?

Business plan

Is my idea financial viable?

How can I get the best deal from suppliers?

Who are my customers?

Community Education

How will people get involved?

Flyer, news release

How will it get started?

Plan of action

How will it be organized?

Farm Management

How will my business survive the next 5 years?

Business plan

Which enterprises are most successful?

Who are the cheapest suppliers?

What is the best marketing strategy?

Appendix

14 Ways To Use Your Personal Computer*

1. **Word processing** — Use the computer instead of a typewriter to write letters, reports or to keep up a mailing list. Children can also use this feature while preparing their homework.
2. **File maintenance** — Use the computer to store and retrieve information such as: a list of household articles for insurance purposes, a record of your correspondence or a list of any collections you might have.
3. **Routine financial activities** — You can balance your checkbook, keep records for taxes and monitor your expenses with a computer.
4. **Financial planning** — Electronic spreadsheets provide you with an opportunity to do simple budgeting as well as forecasting "what if" scenarios.
5. **Investment planning** — You can buy software to help you manage your investment portfolio or evaluate trends.
6. **Bank at home** — Many systems now make it possible to bank at home with your computer and a modem.
7. **Information access** — Your computer and its modem peripheral can hook you up to a data base on almost any topic you can imagine.
8. **Computer programming** — Programming your computer can help solve everyday problems as well as provide you with an intellectually stimulating challenge.
9. **Personal improvement and job skills** — Computer software exists to help you develop skills, work through case studies or practice your professional writing.
10. **Shop at home** — Just as the modem can connect you to banks, it can provide you access to many selections of merchandise.
11. **Health and fitness monitoring** — Software is being developed to help you establish and monitor your daily training schedule and your nutritional intake.
12. **Creative pursuits** — Computers offer the opportunity to create graphics and music at the keyboard, just to mention a few options.
13. **Children's education and play** — A large variety of software exists both to entertain children and also to aid them in their studies.
14. **Environmental control** — Your computer can be hooked up to your house to monitor a sprinkling system or a fire alarm, the heating system, lights, burglar alarm, etc.

*Adapted from *Working Woman*, May 1984.



What Type of Microcomputer Should I Buy?*

Most microcomputer manufacturers and retailers emphasize hardware, recognize software and forget people-ware. Consumers often spend \$4,000 and up on hardware and software that do not meet their needs. Instead of making the purchase fit their needs, they make their needs fit the purchase.

Emphasis on the microcomputer components should be reversed. Consumers should emphasize the people-ware, recognize useful software and let the first two components determine the hardware.

Step 1

- The family should identify its individual and group needs and goals.
- Prioritize your needs from most important to least important.
- Decide which needs can best be performed with and without the aid of a microcomputer. Many tasks are still accomplished more efficiently when done manually.

Step 2

Decide how much your family can spend on hardware, software and accessories.

- Do you have the money in the bank to make the purchase?
- How much money should you save each month to purchase the hardware and software by a given date?
- Does the opportunity cost of using the microcomputer now outweigh the interest cost of a loan?

Step 3

Identify the software that will meet your personal and family needs.

- Read family, special interest and computer magazines to learn about available software.
- Talk to people who own microcomputers, and look at their software.
- Locate reviews and evaluations done on software. Many organizations are currently reviewing software pertaining to their field of speciality.
- Test drive software at hardware and software retail outlets, microcomputer shows, conferences and workshops.

Based on Steps 1, 2 and 3, prioritize your software purchases. Which software packages should your family purchase? (You may not be able to buy all your choices at once.)

Step 4

Identify hardware that will run the software package(s) you have chosen and is also within your budget.

- Read about the hardware that will run software choices.
- Talk to people who own the hardware.
- Visit computer retail stores, and attend computer workshops, conferences and exhibitions.

*Developed by Jacie Jensen, University of Idaho Cooperative Extension Service, 1984.

Step 5

List all the hardware/software options that would assist you in meeting your needs (in order of need priorities). Make your final choice on:

- The retailers' service policies on training and warranty work.
- Strength of the retailer and hardware/software manufacturer.
- Expandability of the hardware/software system. Will the hardware be able to grow as your needs change?

Microcomputer Resources*

Books

Agricultural Software Directory for the Apple Computer, Agriware Company, 342 6 Wyndcrest Dr., Elko, MN 55020. \$19.95 per directory. Descriptions of available software are divided by agricultural applications, i.e. crop, feed, livestock, etc., for Apple computers. It gives you the ability to evaluate more than 200 agricultural programs as to their capabilities and price.

Basic Programs for Home Financial Management, W. B. Goldsmith, Jr., Prentice-Hall, Inc. \$12.95 per book. Provides BASIC programs to help take care of household management. Each chapter includes a program description, a BASIC command listing and a sample screen display and printout. It covers four major areas: money management, credit control, major asset management and investment factors. It is a good way of getting inexpensive programs, however, you do need to change some BASIC commands so the programs will run on your machine.

Computers in the Classroom, Stephen Radin and Fayvian Lee, Science Research Associates, Inc. This book is particularly designed for those of us who are just learning about computers and need some ideas for developing learning tasks. Each section of the book includes a general overview followed by a list of computer tasks as well as noncomputer tasks related to that topic. The list is broken down by age groups.

Computers in Farming: Selection and Use, Steven T. Sonka, McGraw-Hill Publishing Co. \$19.95 per book. Order through Ag Computer Bookshelf, Dept. 6, 8900 Manchester Rd., St. Louis, MO 63144. Gives good overview and introduction of computers in agriculture. Discusses different applications for the farm computer such as record keeping, operational and financial planning, marketing and control of strategic assets.

Electronic Life: How To Think About Computers, Michael Crichton, Knopf Publishing. \$13.95 per book. Recommended for those just getting acquainted with computers. Book is very readable. The appendix contains sample programs for Apple and IBM-PC computers.

Farm Computer Guide, Gary Vincent, Editor, Farm Computer News, Successful Farming, 1716 Locust St., Des Moines, IA 50336. \$3.95 per guide. The contents include such topics as "Computers — the next 'tractor' of farm management," "The tractor won't run without an engine: Pick software before hardware," "The toughest question: What computer do I buy?" and "Learning a new language: Computer glossary."

Instructional Computing for Today's Teachers, Edward Vockell and Robert Rivers, Macmillan Publishing Co. The authors have included an overview of how computers can be used in the classroom, as well as information on and ideas for teaching programming.

Mindstorms: Children, Computers and Powerful Ideas, Seymour Papert, Basic Books, Inc. \$9.95 per book. If you are interested in learning how computers can assist in your child's development, this book is recommended. Papert designed a programming language called "Logo" that is used in many schools today.

The Personal Computer Book, Peter McWilliams, Prelude Press. \$9.95 per book. A guide to terminology used with personal computers, a history of data processing and an overview of personal computer uses in business, education and in the home. Also included is a chapter on drawbacks of personal computers and one on what personal computers do not do well. The author uses many humorous illustrations throughout the book.

*Adapted from *Microcomputer Resources* by Jacie Jensen, University of Idaho Cooperative Extension Service.

VisiCalc Home and Office Companion, David M. Castlewitz and Lawrence J. Chisauksy with Patricia Kronberg. McGraw-Hill Publishing Co. \$15.99 per book. Book presents 50 VisiCalc models; some for home use, others for business applications. Many are applicable for farm management.

Pamphlets

How To Buy a Home Computer, Consumer Information Center, Dept. 419M, Pueblo, CO 81009. \$.50 each. The Consumer Electronic Group of the Electronic Industries Association, in cooperation with the United States Office of Consumer Affairs, has prepared a buyer's primer on home computers. It addresses three basic questions: What can a computer do? What kind should you buy? How much will you pay? For more information contact Ron Juergens at (202) 566-1794.

How To Shop for a Home Computer, U.S. Department of Agriculture, Extension Service, Home Economics and Human Nutrition. Order through the Publication Division, Office of Governmental and Public Affairs, U.S. Department of Agriculture, Washington, DC 20250. Multiple copies should be at no cost for educational purposes.

Networks

Agnet, 105 Miller Hall, University of Nebraska, Lincoln, NE 68583. Cost will vary with location of microcomputer and amount of time used to run a program. Access will cost \$10/hour of connect time for the computer, plus phone charges of \$15 to \$20/hour. Typical application will be under \$5 total cost. Market information can be obtained for about half this amount. Started in 1975 by University of Nebraska and expanded to include five additional partner states: Wyoming, Washington, Montana and the Dakotas. Two hundred plus applications have been developed.

CMN (Computerized Management Network), CMN, Plaza I, Building D, Extension Division, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061. Cost of running the programs varies with the type of program and how adept you are at operating the terminal. You are given an 800 number, therefore, you have no long distance phone charges. The typical cost of analysis is about \$2. You can plan on a connect charge; however, it will be erased as soon as you have used \$25 worth of the system in a month's time. Started in 1969 and 70 computer programs are available (most applicable to farm and family applications).

CompuServe, 5000 Arlington Centre Blvd., Columbus, OH 43220. Cost of service varies with the type of service used, how adept you are at operating your terminal and long distance telephone fees. CompuServe charges no hook-up fee, and its rates are comparable to the Source's. Information is accessed by 12,000 subscribers. The data base is similar but smaller than the Source and a little easier to use.

The Source, Source Telecomputing Corporation, 1616 Anderson Road, McLean, VA 22102 (a subsidiary of The Reader's Digest Association). Cost varies with your location to 350 telephone routing cities, how adept you are at operating the terminal and the service you use. You pay a one-time subscription fee of \$100 and telephone charges. Eight hundred programs and services are used by 10,000 subscribers. Information and programs to access are UPI News Service, electronic mail, travel service, educational programs, consumer aids, general entertainment and advanced programming languages access. Source * Plus, an advanced data base series, has a slightly higher fee base. Additional service includes search for and read articles from 27 business journals, compare stock portfolio with 58 current and historical items of data, monitor congressional activity and an electronic department store.

Dow Jones News/Retrieval Service, Dow Jones & Company, P.O. Box 300, Princeton, NJ 08540. 1-800-257-5114. You receive Dow Jones Business and Economic News, Dow Jones Quotes, Financial and Investment Services and General News and Information. Recommended for professionals and serious investors.

Magazines/Newsletters/Directories

AgriComp, 103 Outdoor Bldg., Columbia, MO 65201. Subscriptions \$15/year. Reviews agricultural software, provides VisiCalc templates and discusses how other farm and ranch managers have put the computer to use. Very objective magazine.

Agricultural Computing, Doane-Western Publishing, 11701 Borman Dr., St. Louis, MO 63146. Subscriptions \$48/year. Includes a monthly newsletter, access to their agriculture data base system and the Source Book. The Source Book is in notebook style and divided into six areas: background and overview, languages and programming, software sources and applications, communications, hardware and other. Updates for the Source Book are frequently sent to the subscriber. The newsletter includes evaluations of current hardware and software, sample VisiCalc templates and articles on computer and agricultural trends.

Computer Software for Home and Home Economics, Strictly Software, 4321 N. 39th St., Phoenix, AZ 85018. 1983 Update Edition—\$12.50. Apple Edition—\$5.50. Atari, IBM and TI Edition—\$3.50. Educator Produced (Micro and Mainframe)—\$9.50. Pet Commodore Edition—\$4.50. Radio Shack Edition—\$6.50. Provides a current list of software available for the home and for home economics education. Five categories for home economics education are: child development and personal/family relationships; consumer economics and management; education; housing, home furnishings and equipment; and nutrition, foods and quantity foods. There is one general personal/home category. Information available on the software is: title, company, price, hardware and description. Does not include software evaluations.

Creative Computing, 39 E Hanover Ave., Morris Plains, NJ 07950. (201) 540-0445. Subscription service: P.O. Box 789-M, Morris Town, NJ 07960. \$25.00/year. Informative journal that emphasizes appliance computers, games and educational applications. Fun, exciting applications are shared.

Directory of Public Domain (and User Supported) Software for the IBM Personal Computer, PC Software Interest Group, Suite 130R, 1556 Halford Ave., Santa Clara, CA 95051. \$2.95 plus shipping and handling/per directory. Listings are programs from clubs, bulletin boards and individuals around the country. No further information is available.

Evaluated Educational Software, MECC Publications, 2520 Broadway Dr., St. Paul, MN 55113. (612) 376-1118. MECC (Minnesota Educational Computer Consortium) reviews most available educational software. Their directory lists only recommended educational software.

Family Computing, Scholastic, Inc., P.O. Box 2512, Boulder, CO 80321. \$17.95/year. 12 issues. Easy reading, fun and informative magazine for all family members. Could provide a lot of 4-H computer projects.

Farm Computer News, Successful Farming, Locust at 17th, Des Moines, IA 50336. Subscriptions \$40/year. Includes update information on software and hardware on the market that is put together in notebook style. Shares with the subscriber how other farms are using the computer. Evaluates new agriculture related computer products. IBM products seem to get more attention in the newsletter than other brands of hardware and software.

Personal Computing, Hayden Publishing Co., Inc., 50 Essex St., Rochelle Park, NJ 07662. Subscriptions \$18/year. Interesting and easy to read articles. Question and answer section is helpful. General magazine which discusses microcomputer applications for a wide range of audiences.

Popular Computing, BYTE Publishing, Inc., 70 Main St., Peterborough, NH 03458. (A McGraw-Hill Publication.) Subscriptions \$15/year, address to Popular Computing, POB 307, Martinsville NJ 08836. Good balance of articles dealing with the use of computers in different fields. Easy to read and interesting reviews.

Public Domain Software Directory, through Enrich Ohaus, 2325 Paradon Dr., San Jose, CA 95131. No cost. Ask for the directory by order number (Commodore 64, VIC 20 and CBM-EN79212; TI-EN79214; Atari-EN79211; Apple-EN79213).

Software Library Catalog, North Central Regional Library, 238 Olds Station Rd., Wenatchee, WA 98801. (509) 663-1117. No charge for the catalog or service. The North Central Regional Library has a library of Public Domain Software for Apple Computers that you can check out through the Mail Order Library. If you are not a Washington resident, your local library can go through the Mail Order Library for you. Programs in the Software Library have been written by microcomputer enthusiasts and donated by computer clubs for use by others. Business and finance, utilities, graphics and sound, education, games, adventure and home are the software categories.

The Home Economist's Computer Newsletter, E.M. Enterprises, 3 Hickory Rd., Denville NJ 07834. \$12/4 issues/year. The newsletter contains information on how computers relate to home economics, career opportunities in the field, tips on writing and finding software, book review and the latest on how home economists are using computer technology.

*Adapted from Microcomputer Resources by Jacie Jensen, University of Idaho Cooperative Extension Service, 1984.

Microcomputer Glossary

6502 — The microprocessor used in the Apple II computer.

ABACUS — An early computing device using beads in a grid to represent numbers.

ACCESS — (1) To interact with a system, logon; (2) the way in which a computer locates memory.

ADDRESS — The name or location at which information is stored in computer memory.

ALGORITHM — A method for solving a particular problem in a limited number of steps. Often a subroutine in a program designed to do one task.

ALPHANUMERIC — A type of character information (letters, numerals and symbols) that will not involve computation.

ALU (Arithmetic Logic Unit) — The part of a computer that performs addition, subtraction, multiplication and division.

ANSI (American National Standards Institute) — A group that sets standards for the computer field.

APPLESOFT — A version of BASIC used in the Apple II family of computers.

ARRAY — An arrangement of memory cells used as subgroups under the same name. Often referred to as a matrix or a table such as a 3x3 table with 9 elements.

ASCII (American Standard Code for Information Interchange) — The standard for information storage in most microcomputers and communication between them.

ASSEMBLER — A program that takes an assembly language and translates it into machine language.

ASSEMBLY LANGUAGE — A language that has a one-to-one correspondence to machine language.

BACKUP — A method of keeping a second copy of information so that it is not lost. Also what the second copy is commonly called.

BASIC (Beginner's All-purpose Symbolic Instruction Code) — A programming language used in most microcomputers.

BAUD — A unit to measure communication speed equivalent to bits per second. The name comes from the French inventory J.M.E. Baudot.

BINARY — The use of the base two number system to encode information. Commonly the symbols 1 and 0 or true and false are used to represent this system.

BIT — (Binary digit) The name used to describe one digit as it represents either 1 or 0 in binary.

BOOT — In microcomputers used to describe the process of loading the disk operating system into the memory of the computer so that disk drives can be used to store and retrieve information.

BUFFER — An area of memory used to hold a section of information temporarily.

BUG — An error in the execution of a program causing it to malfunction.

BYTE — The name used to describe the size of the unit of information that the microprocessor in a computer can process at one time — usually eight bits on a micro.

CAI (Computer Assisted Instruction) — A program that leads a user as a student through a lesson.

CATALOG — A list of the names of files on a disk.

CHARACTER — A unit of information used to describe a letter, numeral or symbol.

CHIP — A semiconductor device on a silicon wafer with pin connectors on either side.

COBOL (Common Business Oriented Language) — A computer language used primarily for business.

CODE — (1) To write in a programming language; (2) the information written in a programming language.

COMMAND — An individual instruction given to a computer.

COMPILER — A computer program that translates one language into another.

COMPUTER — A general purpose device for the manipulation of information.

CONTROL UNIT — The part of a computer that directs the operation of the computer.

CPU (Central Processing Unit) — The device within a computer that takes a series of machine language instructions and operates on data.

CRT (Cathode Ray Tube) — The video display on a computer; the monitor.

CURSOR — The symbol that marks the position of the next character that will be typed.

DAISY-WHEEL PRINTER — An impact printer that prints by striking a wheel containing raised characters against an inked ribbon; usually a slow printer that produces high quality output.

DATA — Information in a form that can be processed by a computer.

DATA BASE — A collection of data stored in a computer or on disk.

DBMS (Data Base Management System) — A software system to operate on a data base.

DEBUG — The process of removing operational errors in a program.

DIGIT — A single numeral used to express a number or part of a number.

DIRECTORY — See catalog.

DISK — A medium of information storage using a flat circular surface to store digital data magnetically.

DISK DRIVE — The mechanical unit that stores and retrieves information on a disk.

DISKETTE — A term used to describe the small disks used on microcomputers.

DOS (Disk Operating System) — The program that allows interaction with a disk drive.

DOT MATRIX — A type of printer using a grid of dots to produce characters on paper.

EDIT — The process of reviewing and modifying documents.

EDITOR — A program that allows the use of computers to perform editing functions.

ELECTRONIC WORKSHEET — A computer program that allows information to be stored in a grid making the relationship between the items easy to understand.

ENIAC — The first electronic computer.

ERROR MESSAGE — An output from a computer to notify the user of a problem in a program.

EXECUTE — The process of passing control of a computer to a program.

FILE — A grouping of information usually on disk that is referred to by name.

FIRMWARE — The system of programs in a computer that cannot be changed by the user.

FLOPPY DISK — See diskette.

FLOW CHART — A series of boxed statements connected by lines used to describe an algorithm.

FORMAT — (1) The form in which information is organized or presented; (2) to prepare a blank disk to hold information; also, initialize.

FORTRAN (FORMula TRANslation language) — A computer language developed for mechanizing mathematical processes.

GRAPHICS — The display of information in the form of pictures or graphs.

HARD COPY — A version of information printed on paper.

HARDWARE — The mechanical parts of a computer system.

HEXADECIMAL — A method of representing numbers in the base 16 number system using the characters 1 to 9 in their usual way and the character A to F to mean 10 to 15.

HIGH LEVEL LANGUAGE — A way of communicating programs to a computer in a method simulating human communication.

I/O (Input/Output) — The communication of a computer with other machines and the outside world.

IC (Integrated Circuit) — See chip.

INITIALIZATION — See format.

INPUT — The process of communicating information into a computer.

INTEGER—A whole number.

INTEGER BASIC — A form of basic allowing only whole numbers.

INTEGRATED CIRCUIT — See chip.

INTERACTIVE — Used to describe software that allows interaction between human and computer during execution.

INTERFACE — A device that allows communication between the computer and the outside world; also, the use of this communication.

INTERPRETER — A program that translates and then executes one instruction at a time.

K (Kilo byte) — 1024 bytes.

LETTER QUALITY PRINTER — A printer that produces high quality output.

LOAD — To transfer a file from disk to main storage.

LOCATION — See address.

LOCK — To prevent a file from being accidentally destroyed by preventing the user from writing to the file or deleting it without first unlocking it.

LOGON — To gain access to a computer, usually a main frame.

LOGO — A high level language used on microcomputers, particularly for graphics, but also for general programming, often by teachers.

LOW LEVEL LANGUAGE — A set of instructions used to communicate with a computer that is close to the machine language.

MACHINE LANGUAGE — The form of information presented to the computer for direct execution.

MAIN FRAME — A large computer that can be used by many different people at one time.

MAIN MEMORY — The internal information holding section of a computer; also RAM.

MATRIX — A way of using information in a grid.

MEMORY — The parts of a computer used for information storage.

MENU — A list of different tasks that can be performed by a computer output on its screen.

MICROCOMPUTER — A small computer.

MICROPROCESSOR — A chip that performs operations in single steps.

MICROSECOND — One millionth of a second.

MNEMONIC — A short easy to remember abbreviation.

MODEM — A device that allows communication between two computers usually over telephone.

NATURAL LANGUAGE — The languages that humans use to communicate with one another.

NETWORK — A collection of interconnected computers.

OBJECT PROGRAM — A program after it has been compiled or assembled.

ONLINE — Used to describe the state of being in communication with a computer.

OPERATING SYSTEM — A program or group of programs that control a computer.

OUTPUT — The movement of information out of a computer; also, that information.

PARALLEL INTERFACE — A communication link that uses several lines to conduct information.

PASCAL — A structured multipurpose computer language named after Blaise Pascal, the inventor of the adding machine.

PASSWORD — A secret identification code used like a key to access a computer.

PERIPHERAL — A device that is used for input or output that is in a communication with a computer.

PILOT (Programmed Inquiry, Learning Or Teaching) — A high level language used to create computer-aided instruction programs.

PRINTER — The device used to deliver output onto paper.

PRINTOUT — See **HARD COPY**.

PROGRAM — A series of instruction directing a computer in the performance of a task.

RAM (Random Access Memory) — The part of a computer that allows information to be stored and changed.

READ — See input.

REAL NUMBER — A number that can have fractional parts. Example: 531.2348.

ROM (Read Only Memory) — The section of a computer where the operating system is stored; cannot be written to.

RUN — See execute.

SAVE — The process of storing information on a disk.

SCROLL — The movement of all information on a computer screen up one line to add a new line at the bottom.

SECTOR — A portion of a disk.

SOFTWARE — A general term to describe computer programs.

STATEMENT — A line of a computer program.

STRING — A series of characters considered as a unit.

TEMPLATE — A predefined set of contents (numbers, text and formulas) for an electronic worksheet designed for some specific purpose.

TERMINAL — A work station including keyboard and monitor that is connected to a computer — usually a main frame.

TERMINAL EMULATOR — A program used to simulate a terminal over communications lines.

TEXT — Character information in a form readable by humans.

TEXTFILE — A file containing text.

THERMAL PRINTER — A printer that applies small points of heat to a special kind of paper to produce printed output.

TRACK — A single circular band of recorded information on a disk.

USER — A human being operating a computer.



USER FRIENDLY — Used to describe computer systems that operate using language and description easy for humans to understand and use.

UTILITY PROGRAM — A program used to perform housekeeping functions within a computer.

VARIABLE — A storage location use by a programming language.

WINDOW — A portion of the display on a computer screen that can be changed without affecting the rest of the screen.

WORD PROCESSOR — A program that is used for creating, modifying or printing text.

WRAPAROUND — The automatic continuation of a line of text onto the following line as on a printer or display screen.

WRITE — To transfer information out of a computer.

WRITE-ENABLE NOTCH — A cut in the side of a floppy disk that allows the computer to change information on it.

WRITE PROTECT — A tab that covers the write-enable notch so that the information on the disk cannot be changed.

Top Down or Structured Programming

While flow charts are a helpful tool in developing a sequence for a program, top down or structured programming is a helpful approach to organizing your programming task. It requires doing the thinking and organizing of ideas and directions on paper first, then breaking the programming down into small sub-tasks, labeling those sub-tasks and finally translating those tasks into a programming language that can be entered or coded into the computer.

As you will recall, labeling your program by using REM or remark statements was introduced in Session II. REM, or in some BASIC Languages, tells the computer to ignore this line and provides you with an opportunity to remind yourself of what you are trying to do. Even with a goodly supply of REM statements, one of the most common problems in programming, especially when the program is long and complicated, is that it becomes difficult to follow. In such circumstances, it is often impossible to find an error.

Arthur Luerhrmann* suggests structuring your program into blocks so that each block represents one activity. This method, like using flow charts, requires organizing your block activities on paper first. While flow charts are helpful in working out the steps in your program, top down programming is a method for simplifying the actual writing of the program. Breaking your program into blocks will make it easier to write as well as to find errors and to edit. Thus, this approach is similar to that of working on an outline. For example, if you were to write a letter to a friend, it might contain the following blocks:

- salutation
- inquiry into friend's health and welfare
- description of your health and welfare
- discussion of latest significant events in your life
- description of the weather
- closure

One of the benefits to this sort of approach for both letters and programs is that some of the blocks could also be used again, say in a letter to your Great Aunt Sally. Similarly, one of the benefits of structured programming is that the individual blocks can be easily inserted into other programs. In order to use this method, you must first break your programming problem into simple tasks. For example, if you were going to write a guessing game program, the initial breakdown of tasks would be:

TASKS

get secret number	120
guess numbers	140
wrap up	160

TOP DOWN PROGRAMMING

GOSUB 200 REM SECRET
GOSUB 400 REM GUESS NUMBERS
GOSUB 600 REM ENDGAME

The GOSUB commands indicate the subroutine for this block, and the REMS describe the function of the block, so it will be easy to reference.

*Material for this information sheet is adapted from Structured Programming in Basic, by Arthur Luerhrmann. May, June and July issues of *Creative Computing*, 1984.

As you begin working through your blocks, you may find that each block will include sub-blocks. For example, in the block GOSUB REM GUESS NUMBERS you may decide to add an additional block, perhaps

TASK		PROGRAM
give hint	450	GOSUB 800 REM GIVE HINT

An additional advantage to using blocks is that, unlike outlining letters, there are basically only three forms of blocks used in a basic program: action blocks, LOOP BLOCKS and branch blocks.

Loop Block — As in the example of counting odd numbers to 99, LOOP BLOCKS always follow a similar format:

	FORMAT	SAMPLE PROGRAM
_____	REM LOOP _____	20 REM LOOP
_____	do something	30 PRINT C
_____	IF exit-condition THEN _____	40 IF C 99 THEN 7
_____	do something	50 LET C = C + 2
_____	GOTO _____	60 GOTO 20
_____	REM END LOOP	70 REM END LOOP

Action Block — An ACTION BLOCK simply gives a straight sequence of action statements. For example:

```

10 REM "SAYS HELLO TO USER"      40 PRINT "HI! ; AS"
20 PRINT "WHAT IS YOUR NAME?"    50 REM "END ACTION BLOCK"
30 INPUT AS

```

Branch Block — A BRANCH BLOCK is used when the computer will take only one of several actions depending on the initial input. An example of a branch program from Luerhrmann asks the user if they want instructions:

_____	IF condition THEN _____	50 IF AS = YES THEN 70
_____	REM FALSE	55 REM FALSE
_____	do something	60 PRINT "OKAY LET'S GET STARTED"
_____	GOTO	65 GOTO 80
_____	REM TRUE	70 REM TRUE
_____	do something	75 GOSUB 1000: "REM INSTRUCTIONS"
_____	REM END IF	80 REM END IF

Notice that the GOSUB 1000 command will take the user to a different block containing instructions. The following are Luerhrmann's guidelines for top down programming:

1. Always start with a simple routine and use English phrases to describe the major tasks.
2. When beginning the general outline of blocks, avoid thinking about details.
3. When you have developed your outline of English phrases, translate each into one or two BASIC statements. If you need more than several program lines for this task, use a GOSUB routine to spell it out.
4. As you write your versions, from general to more detailed, include PRINT statements and RUN the program frequently to check that things are in the proper order.
5. Once you have the subroutines in order, begin working on the detail for each. Use the same procedure 1 to 4 to create each subroutine.
6. Finally, refine and embellish the program, but use the above procedure when modifying the program.



READ!

Parenting and Computers

"The Most Vital Peripheral is You!"

Parents today receive a lot of contradictory information about the impact of computers on children. Some experts argue, for example, that computers are bad for small children because sitting in front of a computer interferes with the natural development of thinking and problem-solving skills. Many of us are turned off by the picture of a child glued to a CRT. We fear that such activity will produce a lonely, isolated child who has not developed good social skills. On the other hand, we are constantly bombarded with ads that infer that we are depriving our children of an important learning opportunity if we don't have a computer. Many of us realize that computers can help our children achieve more, faster, but we want to know at what cost.

I believe that the question of computer/no computer may be the wrong question, and that the solution to kids and computer dilemmas lies in what kind of computer activities we structure for children. This solution requires two things. First, we must understand and accept the personality of the child. Some children are naturally attracted to computers and enjoy that type of activity, while others would prefer to stay outside playing actively all day. We can't force a child to become a different person. In my household, the computer takes a backseat to all kinds of outdoor activities, and I think that's just fine. Forcing a child to sit at a CRT will not help him/her become a high achiever.

The second element in any child/computer education is you, the parent. How you use the computer and how you structure activities that allow the child to work with you on the computer are very important. After all, the computer is first and foremost a tool for problem solving and decision making. Without your example of how to use this tool, the computer is likely to be just a game machine.

Some suggestions for parenting with computers include:

- Work together on problem-solving games and applications.
- Include your child in your regular computer use (he/she can help with data entry, for example), explaining why you are doing what you are doing as you go.
- Insure equal access for all family members and don't allow big brother to hog the machine just because he has better technical skills.
- Allow the child to progress at his/her own speed.
- If you want your child to practice skills, don't sit him/her in front of the keyboard, but don't hover over them either. And finally,
- Be aware that you are establishing a basis for future communications between yourself and your child, as well as modeling effective computer use and problem-solving techniques.

For more information on Parenting and Computers, see back issues of *Family Computing and Parents, Kids, and Computers* by Holmberg and Alper.

Your Computer and You

Computers are fast becoming a common item in both households and work places. While computers can be important tools for work and education, they are also a source of frustration to many people. Here are some ideas for developing a good working relationship with your computer.

Getting Started with Your New Computer

Adding a computer to your work place or home is exciting. However, for many new computer users, the excitement can all too easily give way to frustration. Below are some suggestions for getting started on the right foot.

A. Plan where you will place your new system.

1. Choose the lighting carefully. Sunlight hitting the monitors not only increases eye strain, but it also is not good for the monitor. Sunlight on the back of the system can contribute to overheating problems while the contrast can hurt your eyes. Your system, including the peripherals, should be out of direct sunlight altogether and should be placed so that the lighting is neither directly behind nor in front of the system. Try out several lighting combinations until you find the one that puts the least strain on your eyes.
2. Avoid static electricity. Static electricity can be very dangerous to your system. The resulting shock can damage your equipment and interfere with memory. If static electricity is a problem in your home or office, there are several ways to deal with it including:
 - a. Check to make sure your computer is grounded.
 - b. Make sure peripherals, including drives, are also grounded.
 - c. Use a grounded outlet.
 - d. Carpet contributes to static, so try to put the machine in a room with wood or tile floors.
 - e. Dry air also is a factor, so a humidifier will help.
 - f. Use a static mat or static spray to help reduce severe problems. (An anti-static spray can be made with Downey fabric softener.)
 - g. Remember surge protectors do not protect against static shocks.
 - h. Always touch something plastic before touching the machine or your diskettes.
3. Avoid areas with dust or smoke. Both dust and smoke, either cigarette or wood smoke, is damaging to the machine. If you live with a wood stove, a heavy smoker, or in a dusty area, be sure to cover the equipment and your diskettes whenever they are not in use. Try to find a location for the computer where it has maximum protection from dust and smoke.
4. Beware of temperature extremes. Try to place your equipment where it gets neither very cold nor very hot.
5. Plan your connections.
 - a. Since on/off switches are often the first thing to need replacement, some experts suggest using a multi-outlet box with an on/off switch. Such a system will allow you to turn on your whole system with one switch, cutting down the wear on the computer's on/off switch.
 - b. When choosing an outlet for your system, choose one that has no heavy appliances that can drain power or cause overloads. You may wish to connect your computer directly to the electrical box so it has its own fuse or switch.

- c. Many experts suggest protecting your computer from electrical surges with a surge protector. Some protectors can be wired in at the box, while others are part of the cord. Surge protectors vary in cost and quality. Only those with a very quick response time are effective, so it is necessary to shop wisely.

6. Organize your supplies so they will be close at hand and easily found.

7. Start a log of questions and concerns you discover as you work and keep track of your progress.

B. Develop a system to manage your diskettes.

Diskette management is a problem for many new users who begin computing without developing a system for storing their files and their diskettes. Without such a system, one can spend a great deal of time searching for the right file.

1. Formatting disks

In order to begin using a new disk, it must be formatted or initialized to work with your computer. This process is often described as mapping the disk so your computer knows where to store data and how to retrieve it. Often new users will develop a program they like, but because they have not formatted any disks, they cannot store it. Having a system for keeping track of your disks can alleviate this problem.

If you do a great deal of programming, you will always want to keep some formatted or initialized diskettes on hand. One suggestion is to format the whole box when the box is opened. If, however, most of your work is done with software that has a formatting function, you may wish to format as you go.

2. Organizing disks

Keeping track of diskettes can be done several ways. You can label each diskette with its contents, print out the diskette catalog, or you can buy a diskette cataloging program. Before you decide on a method or combination of methods for keeping track of your diskettes, you need to first consider a method for using them. Some users use diskettes chronologically and, therefore, use dates to label them. Others prefer to use a combination of chronological and topical labeling such as: Programming 5/12-7/20, or Correspondence 5/12-7/20, or Accounting Data 5/12-7/20. Finally, some people like to label by topic alone such as: Correspondence, Family Checkbook, or Addresses.

3. Backing up

In addition to developing a method for using and labeling diskettes, you will also need to develop a method for backing up your work. Some people prefer to copy files or even the whole diskette onto a new diskette. Others save their files twice, once on the original diskette and once on the back-up diskette. Whatever your method, get in the habit of using it right at the beginning and keep up with it so your work will always be protected.

4. Using your disks

Diskettes are pretty hardy, but following these precautions will help insure against accidents.

- a. Never touch the magnetic surface of diskettes. Fingerprints can cause errors.
- b. Don't try to clean diskettes with alcohol or any kind of cleaner.
- c. Avoid using magnets or magnetized objects near diskettes.
- d. Do not bend, fold, or staple.
- e. Do not use paper clips or rubber bands on diskettes.
- f. Avoid placing heavy objects on diskettes.

- g. Don't write on disks with pencils or ball-point pens. Use felt-tipped pens or, better yet, write on the labels before putting the labels on disks.
 - h. Don't layer labels.
 - i. Insert the diskette into drive carefully to avoid jamming.
 - j. Don't use erasers on disk.
 - k. Recommended operating environment is: 50°F to 122°F with relative humidity of 20% to 80%.
5. Storing your disks
- a. Keep the diskette in its jacket when not in use.
 - b. Avoid storing diskettes on or near the machine.
 - c. Store diskettes vertically in their box or other appropriate container.
 - d. Avoid exposing disks to direct sunlight or excessive heat.
 - e. Most manufacturers recommend that diskettes be taken out of the disk drive when you are finished with that application. Storing diskettes in the machine and leaving them there while the machine is turned on or off can cause damage. Check with your owner's manual to make sure of the proper procedures to be used with your machine.
 - f. Diskettes store best in temperatures ranging from 40°F to 127°F with relative humidity at 8% to 80%.
 - g. Diskettes stored properly in their jackets and boxes can tolerate temperatures from -40°F to 127°F and humidity from 8% to 90% when being moved from one location to another. Allow diskettes to reach room temperature before using.

C. Getting acquainted with your computer.

Planning where to set up your computer and how to manage your disks is only part of the preparation you will need to make. Many new computer owners are frustrated at the time and energy it takes to get used to their new machine. As a result, one estimate has it that 80% of the home computers bought are not used regularly. Below are some suggestions to help you through the adjustment period.

- 1. Get into a routine of use that includes using back-up procedures. Since learning to use both hardware and software can be time consuming and frustrating, the routine can also be helpful in establishing a time when you don't want to be interrupted. At the same time, it is important to set some time when the family can work together with the computer.
- 2. Start a notebook or journal to keep track of what you are learning, what your questions are, and any contact you have with service or support personnel.
- 3. Consider taking a course to get you started. Check with your local school district or college to find out what classes are available.

Prevention and Maintenance

While most of us have had prevention and maintenance drilled into us about cars and other appliances, many computer owners are uncertain about how to apply a program of regular maintenance to their computer system.

Family Computing (February, 1983) has the following suggestions:

A. During set-up:

- 1. Send in the warranty cards immediately upon purchase.
- 2. Save the original packing in case you need to send the equipment back or want to move it elsewhere.

3. Read the manual carefully and follow instructions as to setting up your system.
4. Call your dealer or the manufacturer if you have any questions or the instructions are unclear.
5. Find out where the nearest users' group meets and join it.
6. Buy or make lint-free dust covers.
7. Check to see that the computer is grounded and investigate surge protectors.
8. If your household or office is subject to extreme heat, consider buying a cooling fan.
9. Label or color code cables.
10. Check your insurance policy to be sure it will cover your new equipment.

B. Before the warranty runs out:

1. Use the computer heavily during the warranty period and keep track of anything odd. Take it back to the dealer at least one month before the warranty expires to have those oddities checked.
2. Go over each piece of equipment checking to see that it works well, that the monitor's color and focus is good, that the printer will handle long, involved jobs and that the computer can handle a heavy load without problems.
3. Check into the possibility of a service contract. One estimate is that keyboards are likely to need repair after a year or two of heavy usage, so it may pay to have a contract to take care of such things.
4. Find a competent repair person. Check with your users' groups, the dealer and the manufacturer for referrals. Then, if you have problems, you'll know where to take them.

C. Prevention during regular usage:

1. Avoid having food or drink near the computer.
2. Set guidelines for children including washing their hands before using the computer or handling equipment and disks, and avoiding pounding on the keys.
3. Touch something plastic before touching the machine to release any static electricity.
4. Don't leave the machine on with the same words displayed; they can burn an image into the monitor.
5. Do not use the computer during a lightning storm.
6. If you will be using the computer intermittently during the day, it will put less strain on the system to leave it on the whole time rather than to turn it on and off each time you use it.
7. Don't go off and leave the computer on all day or night when it's not in use.
8. Know when to quit. When things get too frustrating or you are too tired, it is easy to make some very bad mistakes, so know when it is time to take a break and to leave it for another day.
9. Keep disk drives closed to keep out dust unless otherwise instructed in your manual.
10. Remove disks from drive when you are finished using them.
11. Avoid having magnets or magnetized objects near the computer.

D. Care and cleaning of your computer:

1. As part of the regular housekeeping routine, vacuum all openings to the computer including vents, cable outlets, seams, etc. Vacuum the keyboard as well. Clean the monitor with an anti-static cleaner or a glass cleaner. Wipe casings with the cleaner recommended by the manufacturer. Vacuum and dust the work area.

2. Clean the platen and roller on your printer with the cleaner recommended by the manufacturer every couple of months. Unplug the machine before cleaning. Vacuum around the mechanical parts to remove dust.
3. Clean the dust covers regularly.
4. Inspect connections and ports for sign of wear or loose connections at reasonable intervals.
5. Provide regular maintenance for your disk drives. Check with your dealer about the advisability of using a disk cleaning set on your machine. Be aware that overuse of a disk cleaning system can damage the heads.
6. Several times a year, unless otherwise instructed in the owner's manual, clean line connectors with rubbing alcohol and Q-tips.

Troubleshooting Techniques When Your Computer Is Down

- A. Buy a general repair guide. *Family Computing* author J. Austin recommends *The Plain English Repair and Maintenance Guide for Home Computers* by Henry Beechold, published by Simon and Schuster.
- B. Austin also suggests that when something goes wrong, the first thing to do is turn off the machine and give both it and you a rest. If the problem is generated by an overheated unit, it will probably self-correct. However, if that is the case, you will need to address this problem in the future because overheating can burn up critical components.
- C. Check all connections to make sure the problem is not a loose cable.
- D. If you can get into your computer, disconnect the power and check connections inside. Gently push on the cards and chips to see if they are seated properly. It is estimated that 85% of computer problems are the result of loose connections or the poor soldering of connections.
- E. Connections can be cleaned with alcohol, or some people use a pencil eraser. If you use an eraser, you will need to clean the area carefully after you have finished.
- F. Check screws and mechanical connections to be sure they are tight.
- G. If you have checked everything and it is still no go, here are some suggestions for what to do next:
 1. Call you dealer or the customer service number and go over your problem with a technician.
 2. Run a diagnostic disk to help isolate the problem.
 3. Check with people in your user's group to see if anyone else has experienced the same problem.
 4. If you can get into your computer and have a friend with a similar set-up, you can swap drives, cards, cables, etc., to help isolate the problem.
- H. Information on diskettes damaged when a computer goes down can often be saved, so don't throw away the diskette in despair until you do some checking around.
- I. If you need to turn it over to an expert's care, pack it carefully in the original cartons, check with the manufacturer for information on freight charges, estimated time for repair, shipping procedures, etc., double check all addresses and insure the package. If the equipment is being mailed or sent UPS, it is also important to insure the equipment for its value and to double-check all addresses. Some manufacturers require you to phone in and get an authorization number before the equipment is mailed. Check to make sure this number is clearly displayed. If you are working with a local dealer, get a written estimate of the bill and check to see if a loaner is available during lengthy repairs.

Transporting Your Computer

Most of us, at some time, will want to move our computer. Either we will need to send it off for repair, or we may want to take it on a visit or vacation. Therefore, it is important to save the original packing the equipment was shipped in. Repacking the equipment just as it came will insure a safe trip. Seal the cartons well to keep dust out.

If you are taking the computer with you to set up in another location, make a checklist of every piece of equipment you move. Check the list each time you pack the equipment. Find out ahead of time if the new location has the proper electrical outlets. You might wish to take an extension cord just in case. In addition, you may wish to color code cables to facilitate reconnection. If you will be transporting the equipment in either very hot or cold weather, allow it to come to room temperature before using.

Enjoy Your Computer in Good Health

A great deal of controversy surrounds the question of how using a computer affects health. By far the most common complaints of those who work with computers have to do with eye strain and back and neck strain. In addition, there is evidence to substantiate a warning to pregnant women to avoid prolonged exposure to CRTs. Here are a few hints for having a healthy approach to computer use.

- A. To avoid eye strain, make sure the lighting in the room does not throw a glare on the screen.
- B. While working on the computer, rest your eyes every ten minutes by looking up and at items far away.
- C. Purchase a non-glare screen cover.
- D. Don't keep using the computer when your eyes are tired.
- E. Make sure the computer is the right height for you, so you can avoid straining both your neck and your back reaching the keys or looking at the screen.
- F. Use a comfortable, but supportive chair.
- G. Do not sit in one posture for an extended period of time; build regular stretch breaks into your routine.
- H. One method people use is to develop a habit of saving ten minutes of each hour and using that time to stretch eyes, back, neck, and legs.
- I. Purchase a radiation blocking screen for your CRT.
- J. As with anything, remember that too much of something is often the culprit, not the activity itself.

Expanding or Replacing Your System

Many computer users will want to expand their system as their use of the computer becomes more and more sophisticated. A system can be expanded by replacing or adding to the computer itself, adding peripherals or increasing your software library. Regardless of what you do to expand your system, most experts suggest that you avoid mail order purchases unless you are sure of the company's reputation and will require absolutely no technical assistance.

Enhancing Your Computer — Many of today's computers are built so they can be easily enhanced or expanded. Extra slots are available to expand the memory, add communications, or add an additional language. Other computers, for example the Macintosh, must be returned to the dealer or the manufacturer for expansion. The cost of enhancement varies from computer to computer. Many computer owners will add new peripherals as they discover more uses for their computer. They may wish to add a different printer, either letter quality or dot matrix, add a mouse, a number pad or any number of items. It is important to check the owner's manual and with your dealer to make sure that the peripheral you have in mind is compatible with your computer. If you belong to a user's group, you can get referrals from other members on what type of products work best with your machine.

Replacing the System — Despite expandability, some people feel they have grown out of their old system and want to replace it with something more powerful. This leaves the question of what to do with the old system. Some families have kept the old system for easy tasks or for the kids. Others have sold the old system to help defray the costs of the new system. Still others have donated their old system to the local schools. What you decide to do will depend on your cash flow, your taxes and your family needs. The decision of whether to expand or to invest in a different computer is a difficult one to make. Some questions to consider include:

1. Who in the family will use the old computer if we keep it? What will they use it for? Can they make the same use of the new computer or are there time conflicts and software problems?
2. How would making a donation of the old computer affect our taxes? Remember, in Idaho donations to schools count as a tax credit.
3. What type of system does the local school use? Would they consider a donation? If not, how about the library or other nonprofit groups?
4. How important is it to get some money for the old computer to help finance the new one?
5. Is it possible to transport the data you now have on disk to the new computer or will you lose access to that information?
6. How important is speed of operations to your work? Will a new computer make a significant difference?
7. How much of an investment will you have to make in new software if you get a new machine? Are the programs you like and are familiar with available for the new computer?
8. What are the possibilities of selling your old computer? What is its resale value?

One method to help you with your decision is to make a list of all the advantages and disadvantages of both expanding and buying a new computer. Then, think about what is most important to you in making the decision; for example, cost, ability to complete a project, storage space, etc. Prioritize both lists according to those items that are most important to you. Analyze your lists to see which advantages have been prioritized.

EQUALS: Startling Computer Statements

Question	Answer	Source and Comments
1. What percent of home computer users are male?	93%	Scientific Manpower Commission, Manpower Comments, Vol. 21, No. 6, July-August, 1984. Men are also 77% of working computer systems analysts and 77% of computer science majors.
2. What percent of twelfth grade Pascal programmers are male?	72%	California Assessment Program 1984 Report. California State Department of Education, 1984. Pascal is the high school programming language required for advanced placement in computer science. Roughly half of the 17,861 twelfth graders in this survey had never used a programming language or had access to a computer at home or at school.
3. What is the median annual income of electronic engineers?	\$46,100	Scientific Manpower Commission, Manpower Comments, Vol. 22, No. 4, May 1985. The \$46,100 median is up 15% over 1983, based on more than 11,000 responses from non-student members of the Institute of Electrical and Electronics Engineers. EEs in San Francisco/Oakland and vicinity have the highest median income in the U.S. at \$53,000.
4. There are almost 14 million computers in American homes. How many computers are in the schools?	Fewer than one million	McGinty, Tony. "Making the Home-School Connection," Electronic Learning, Vol. 5, No. 3, November-December, 1985. According to Market Data Retrieval, Apple Computer has 50.9% of the school microcomputer market, Radio Shack 19.7%, Commodore 15.2% and IBM 3.5%.
5. How many mathematics and science teaching positions in California were filled by non-math and science teachers last year?	1400	Seaborg, Glenn. Math-Science Task Force Report, California Roundtable, San Francisco, California, 1985. In the coming academic year, California schools will need to hire 2000 to 2500 teachers of science and mathematics, while colleges and universities in the state are educating fewer than 500 a year.

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| 6. Blacks, Hispanics, and Native Americans are more than 20% of the population. Counting all fields, what percent of the bachelor's degrees do they earn? | 9% | Ford Foundation Letter, Vol. 16, No. 4, August 1, 1985.

Between 1973 and 1983, tuition and fees at public institutions increased by 94% and at private colleges by 119%. During that same period, minority family income averaged roughly two-thirds of the median for white families. The declining number of federal fellowships further limited the minority presence in graduate schools. They earned about 6% of the doctoral degrees. |
| 7. The number of microcomputers in affluent schools increased 47% last year. What was the increase for poorer schools? | 36% | Market Data Retrieval, Westport, Connecticut, 1985.

Private non-Catholic schools average one computer for every 40.5 students compared to one per 63.5 students in public schools and one per 73.5 in the generally less affluent Catholic schools. California public schools have one machine for every 81.2 students, while New York has one per 65.3 students. |
| 8. What percent of BYTE Magazine subscribers are female? | 5% | BYTE Editorial Study, McGraw Hill Research, August, 1983.

Four percent of the articles are written by women. The average reader age is 36. Data were not collected on minorities. |
| 9. What percent of science and engineering jobs are held by Blacks? | 2.4% | Scientific Manpower Commission, Manpower Comments, Vol. 22, No. 6, July-August 1985

Employment of Blacks almost tripled between 1972 and 1982, the Black share of the science and engineering jobs going from roughly 1% to 2.6%. About one-fifth of the approximately 82,000 Black scientists and engineers are computer specialists and over half the Black computer specialists are women. By contrast, only one-quarter of the white computer specialists are women. |
| 10. What percent of twelfth grade students agreed with this statement: "Computers are suited for repetitive monotonous tasks." | 18% | California Assessment Program 1984 Report. California State Department of Education, 1984.

The students who agreed with the statement were the ones who did particularly well in the cognitive tests given during the same study. About 63% of them were male, 37% female. |

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| 11. In a survey of teachers "not enough computers" was considered the most serious problem in computer use. What was the second most serious problem? | No time for the teacher to develop computer-based activities. | <p>Becker, Henry Jay. Second National Survey of Instructional Uses of School Computers, Center for the Social Organizations of Schools, Johns Hopkins University, 1985.</p> <p>The data were collected February to June 1985, from 2300 schools across the United States. Among the other problems mentioned by teachers were: software too costly, not enough money for teacher training, hard to locate and evaluate software and poor quality of software. Education Week, Vol. 2, No. 39, July 27, 1983.</p> |
| 12. One hundred new mathematics and science computer software packages appear on the market every month. How many of these are for drill and practice? | 90% | <p>Drill and practice has its place, but it is important for all children to have experience with computer problem-solving, programming and using software tools for data base management and word processing. There is evidence that girls and some minorities are being treated differently from the majority of boys in this regard.</p> |
| 13. Women purchased 45% of the new cars sold in 1983. What percent of the microcomputers did women purchase? | 2% | <p>San Francisco Examiner and Chronicle, July 31 1983.</p> <p>The computer industry has made little effort to appeal to women. "Women's Ware" is a recently introduced software package, but Infoworld (September 17, 1984) contacted market researchers and software companies to find out if they had seen other packages directed toward women; only two people had seen such products.</p> |
| 14. Male faculty salaries in higher education exceeded those of women by 17.1% in 1972-73. What was the figure in 1982-83? | 17.9% | <p>Association of American Colleges, On With Women, Vol. 15, No. 1, Summer 1985.</p> <p>Salary differentials are greatest for full professors, regardless of field, and are greater in business, chemistry and in the biological sciences. Between 1972 and 1981 the percent of full professors who are women increased by 1%, from 10.8% to 11.8%.</p> |
| 15. What percent of science and engineering jobs are held by Hispanics? | 2% | <p>National Science Foundation, Women and Minorities in Science and Engineering, January, 1984.</p> <p>Women are more highly represented among Hispanic scientists and engineers than are all women among all scientists and engineers. About 16% of the 74,000 Hispanic engineers and scientists are women, compared with 13% for all scientists and engineers.</p> |

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| 16. How many teachers work at other jobs to supplement their salaries? | 50% | <p>Education Digest, October, 1984</p> <p>National Institute of Education estimated that the country will have 34% fewer teachers than are needed by 1992. In the Metropolitan Life Survey of the American Teacher, 95% said that providing teachers with "a decent salary" would facilitate "keeping good teachers." Nearly 80% said that "providing compensation to beginning teachers comparable to other professions that require similar training" would raise the quality of people coming into the profession.</p> |
| 17. Over 20% of the high schools with computers in 1983 reported that none of the teachers were using the computers with students. What was the figure for 1985? | Less than 3% | <p>Becker, Henry Jay. The Second National U.S. Survey of Instructional Uses of School Computers, Center for Social Organization of Schools, Johns Hopkins University, 1985.</p> <p>The number of secondary schools with computers reporting six or more teachers using them with students rose from about 8% to about 33%. About one quarter of American schools reported having enough computers to serve at least a half classroom of students at one time.</p> |
| 18. By 1995, what percent of all new jobs will be technology-oriented? | 6% | <p>U.S. Department of Labor, Bureau of Statistics, Occupational Outlook Quarterly, Vol. 28, No. 1, Spring 1984.</p> <p>Technology-oriented occupations are increasing fast, but still make up a small part of the work force. These jobs include engineers, life and physical scientists, mathematical specialists, computer specialists and engineering, science and computer technicians. Computer service technicians have the fastest projected growth rate, with employment expected to increase about 97% by 1995.</p> |

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